MATRIX MODE *(Version 3.20)*

TOA

INSTALLATION AND OPERATING INSTRUCTIONS

9000 SERIES AMPLIFIERS

M-9000
A-9060DH
A-9120DH
A-9120DL
A-9060S
A-9120S
A-9240SH

This manual is intended for those who use the 9000 Series Amplifier in the Matrix mode.
For use in the Mixer mode, please read the separate instruction manual for the Mixer mode.

Thank you for purchasing TOA's 9000 series Amplifier.
Please carefully follow the instructions in this manual to ensure long, trouble-free use of your equipment.

TOA Corporation

TABLE OF CONTENTS

1. IMPORTANT SAFETY INSTRUCTIONS 6

2. SAFETY PRECAUTIONS 7

3. GENERAL DESCRIPTION 9

4. FEATURES 10

5. INSTALLATION PRECAUTIONS 11

6. HANDLING PRECAUTIONS 11

7. NOMENCLATURE AND FUNCTIONS

7.1. M-9000 (Matrix Mixer Pre-Amplifier), A-9060DH/9120DH/9120DL/9060S/9120S/9240SH (Matrix Mixer Power Amplifiers)

[Front] 12

[VFD on-screen indications] 13

[Changing the indicated channels on the LEVEL output meter] 15

[Changing the input and output meter display status] 15

[Rear] 16

7.2. Optional Modules

7.2.1. D-001T and D-001R (2-channel Input Modules) 18

7.2.2. T-001T (Audio Output Expansion Module) 18

7.2.3. ZP-001T (Zone Paging Module) 19

7.2.4. C-001T (Control I/O Expansion Module) 20

7.2.5. AN-001T (Ambient Noise Sensor Input Module) 20

7.3. Optional Accessories

7.3.1. AN-9001 (Ceiling Mount Microphone) 21

7.3.2. ZM-9001 (Zone Manager) 22

7.3.3. ZM-9002 (Zone Manager) 23

7.3.4. ZM-9003 (Zone Manager) 24

7.3.5. SS-9001 (Speaker Selector) 25

8. DESCRIPTION OF MATRIX MODE

8.1. General Description

8.1.1. Normal matrix operation 26

8.1.2. 1-channel output operation 27

8.1.3. 2-channel output operation (BGM/Paging operation) 27

8.2. Glossary 28

9. OPERATION

9.1. Normal Use

9.1.1. Keys and knobs 29

9.1.2. Power ON/OFF 29

9.1.3. Changing the input volume 30

9.1.4. Changing the output volume 30

9.1.5. Input channel ON/OFF 30

9.1.6. Output channel ON/OFF 30

9.2. Zone Paging
9.2.1. Paging port mode 31
9.2.2. Ring signal mode 32
9.3. Releasing Key Lock 33

10. PAGING WHILE POWER IS OFF 34

11. SYSTEM DESIGN-TO-OPERATION FLOW 35

12. SELECTING OPERATION METHOD 36

13. SETTING
13.1. Setting Menu Flow 37
13.2. Setting Keys and Knobs 38
13.3. Basic Setting Operation
13.3.1. Entering the setting mode 39
13.3.2. Setting screen operation examples 39
13.3.3. Returning from setting mode to normal use state 40
13.4. Input Parameter Setting
13.4.1. Setting flow chart 41
13.4.2. Input setting items 43
13.5. Audio Output Name Setting
13.5.1. Setting flow chart 46
13.5.2. Audio output setting items 46
13.6. Event Setting (Only in the normal matrix operation)
13.6.1. Setting flow chart 47
13.6.2. Event setting items 48
13.7. Utility Setting
13.7.1. Setting flow chart 52
13.7.2. Utility setting items 56
13.8. Adjustment Mode Setting
13.8.1. Settings in adjustment mode 66
13.8.2. Adjustment mode setting flow chart 68
13.8.3. Adjustment mode setting items 69
13.9. Key Lock Function Setting
13.9.1. Keys that can be locked 78
13.9.2. Key lock function setting flow chart 79
13.9.3. Key lock function setting items 80
13.9.4. Password setting 82
13.9.5. Key lock setting operation 83

14. RESTORING FACTORY DEFAULT SETTING 84
14.1. Default Setting Table
14.1.1. Input settings 85
14.1.2. Audio output settings 85
14.1.3. Event settings 85
14.1.4. Utility settings 86
14.1.5. Adjustment mode settings 87

15. MODULE INSTALLATION

15.1. Module Combination 89
15.2. Channel Numbers and Terminal Numbers 89
15.3. Module Installation 89
15.4. Module Installation Examples 91

16. CONNECTIONS

16.1. Control I/O Terminal Connections
16.1.1. When a variable resistor or variable DC power supply unit is connected 92
16.1.2. When the ZM-9001 or ZM-9002 is connected 93
16.1.3. When the ZM-9003 is connected 93
16.1.4. When the SS-9001 is connected 93
16.1.5. Operation by control input 94
16.2. Speaker Output Terminal Connections
16.2.1. A-9060S and A-9120S 96
16.2.2. A-9060DH and A-9120DH 97
16.2.3. A-9240SH 97
16.2.4. A-9120DL 97
16.3. C-001T Module Connections
16.3.1. Control input terminal 98
16.3.2. Control output terminal 98
16.3.3. Connecting the ZM-9003 98
16.3.4. Connecting the SS-9001 99
16.4. RS-232C Connector Connection 100
16.5. AN-001T and AN-9001 Connections 100
16.6. Power Source Connections to the SS-9001
16.6.1. When using a 24 V DC power source 101
16.6.2. When using the optional AC adapter 101
16.7. Removable Terminal Plug Connection 102

17. RACK MOUNTING BRACKET ATTACHMENT 103

18. AN-9001 INSTALLATION 104

19. DIMENSIONAL DIAGRAMS

19.1. AN-9001 105
19.2. ZM-9001 106
19.3. ZM-9002 106
19.4. ZM-9003 107
19.5. SS-9001 108

20. HOW TO USE THE SUPPLIED SOFTWARE

20.1. General Description 109
20.2. Installing the Software 110
20.3. Connecting the Unit to the PC 110
20.4. Setting the Communication Port and Speed 111
20.5. Updating the Firmware 112
20.6. Storing or Recalling Parameters Set at the Unit 114
20.7. Monitoring the Unit's Operation Status 116
20.8. Activating the Control Input 118

21. ERROR INDICATIONS 119

22. TROUBLESHOOTING 120

23. BLOCK DIAGRAM 121

24. SIGNAL FLOW DIAGRAM 122

25. LEVEL DIAGRAM 123

26. COMPRESSION CHARACTERISTICS DIAGRAM 124

27. SPECIFICATIONS

27.1. M-9000 125
27.2. A-9060DH, A-9120DH 127
27.3. A-9120DL 129
27.4. A-9060S, A-9120S 131
27.5. A-9240SH 133
27.6. Optional Modules
27.6.1. D-001T 135
27.6.2. D-001R 136
27.6.3. T-001T 137
27.6.4. C-001T 138
27.6.5. ZP-001T 138
27.6.6. AN-001T 139
27.7. Optional Accessories
27.7.1. AN-9001 140
27.7.2. ZM-9001 140
27.7.3. ZM-9002 140
27.7.4. ZM-9003 141
27.7.5. SS-9001 141

1. IMPORTANT SAFETY INSTRUCTIONS

- Read these instructions.
- Keep these instructions.
- Heed all warnings.
- Follow all instructions.
- Do not use this apparatus near water.
- Clean only with dry cloth.
- Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
- Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
- Only use attachments/accessories specified by the manufacturer.
- Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.

- Unplug this apparatus during lightning storms or when unused for long periods of time.
- Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

FCC REQUIREMENTS

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

2. SAFETY PRECAUTIONS

- Before installation or use, be sure to carefully read all the instructions in this section for correct and safe operation.
- Be sure to follow all the precautionary instructions in this section, which contain important warnings and/or cautions regarding safety.
- After reading, keep this manual handy for future reference.

Safety Symbol and Message Conventions

Safety symbols and messages described below are used in this manual to prevent bodily injury and property damage which could result from mishandling. Before operating your product, read this manual first and understand the safety symbols and messages so you are thoroughly aware of the potential safety hazards.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operation and maintenance (servicing) instruction in the literature accompanying the appliance.

⚠ WARNING Indicates a potentially hazardous situation which, if mishandled, could result in death or serious personal injury.

When Installing the Unit

- Do not expose the unit to rain or an environment where it may be splashed by water or other liquids, as doing so may result in fire or electric shock.
- Use the unit only with the voltage specified on the unit. Using a voltage higher than that which is specified may result in fire or electric shock.
- Do not cut, kink, otherwise damage nor modify the power supply cord. In addition, avoid using the power cord in close proximity to heaters, and never place heavy objects -- including the unit itself -- on the power cord, as doing so may result in fire or electric shock.
- Avoid installing or mounting the unit in unstable locations, such as on a rickety table or a slanted surface. Doing so may result in the unit falling down and causing personal injury and/or property damage.
- External wiring connected to the terminals marked with ϟ requires installation by an instructed person.
- The apparatus shall be connected to a mains socket outlet with a protective earthing connection.
- The socket-outlet shall be installed near the equipment and the plug shall be easily accessible.
- Use the supplied rack mounting bracket when mounting the unit in an equipment rack. Remove four M4 x 8 screws on both sides of the unit, and mount the bracket there using the supplied M4 x 16 screws instead.

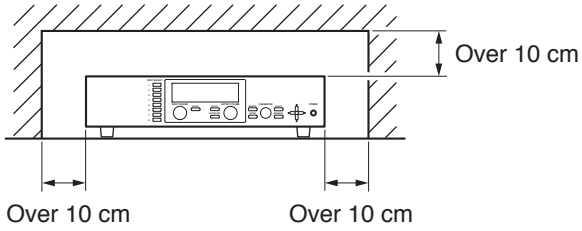
When the Unit is in Use

- Should the following irregularity be found during use, immediately switch off the power, disconnect the power supply plug from the AC outlet and contact your nearest TOA dealer. Make no further attempt to operate the unit in this condition as this may cause fire or electric shock.
  - · If you detect smoke or a strange smell coming from the unit
  - · If water or any metallic object gets into the unit
  - · If the unit falls, or the unit case breaks
  - · If the power supply cord is damaged (exposure of the core, disconnection, etc.)
  - · If it is malfunctioning (no tone sounds.)
- To prevent a fire or electric shock, never open nor remove the unit case as there are high voltage components inside the unit. Refer all servicing to your nearest TOA dealer.
- Do not place cups, bowls, or other containers of liquid or metallic objects on top of the unit. If they accidentally spill into the unit, this may cause a fire or electric shock.

⚠ CAUTION Indicates a potentially hazardous situation which, if mishandled, could result in moderate or minor personal injury, and/or property damage.

When Installing the Unit

- Never plug in nor remove the power supply plug with wet hands, as doing so may cause electric shock.
- When unplugging the power supply cord, be sure to grasp the power supply plug; never pull on the cord itself. Operating the unit with a damaged power supply cord may cause a fire or electric shock.
- Do not block the ventilation slots in the unit's cover. Doing so may cause heat to build up inside the unit and result in fire.
- Avoid installing the unit in humid or dusty locations, in locations exposed to the direct sunlight, near the heaters, or in locations generating sooty smoke or steam as doing otherwise may result in fire or electric shock.
- To avoid electric shocks, be sure to unplug the unit's power supply cord when connecting speakers.
- Be sure to follow the instructions below when rack-mounting the unit. Failure to do so may cause a fire or personal injury.
  - Install the equipment rack on a stable, hard floor. Fix it with anchor bolts or take other arrangements to prevent it from falling down.
  - When connecting the unit's power cord to an AC outlet, use the AC outlet with current capacity allowable to the unit.
  - No rack-mounting screws are supplied with the unit. Separately prepare the appropriate screws for the rack.
- Keep the 9000 series amplifiers over 10 cm away from objects that may obstruct air flow to prevent the unit's internal temperature rise.



When the Unit is in Use

- Do not operate the unit for an extended period of time with the sound distorting. This is an indication of a malfunction, which in turn can cause heat to generate and result in a fire.
- Switch off the power, and unplug the power supply plug from the AC outlet for safety purposes when cleaning or leaving the unit unused for 10 days or more. Doing otherwise may cause a fire or electric shock.

An all-pole mains switch with a contact separation of at least 3 mm in each pole shall be incorporated in the electrical installation of the building.

The lighting flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

⚠ ATTENTION

L'appareil ne doit pas être exposé aux éclaboussures ou écoulements et tous objets remplis de liquide, tels que vases, ne doivent pas être sur l'appareil.

3. GENERAL DESCRIPTION

TOA's 9000 Series Amplifiers are Matrix Mixers designed to be used in conjunction with optional modules and can be configured for up to 8 inputs and 8 outputs. Usable modules include the following 9000 series plug-in modules: D-001T and D-001R (2-channel input), T-001T (Audio output expansion), C-001T (Control I/O expansion), ZP-001T (Zone paging), and AN-001T (Ambient noise sensor), as well as 900 series input modules. The most appropriate modules can be selected depending on applications.

By changing operation mode, the 9000 Series Amplifier can be used either as a matrix system suited to BGM or paging broadcasts, or as a mixer that is appropriate for speech or sound reinforcement applications. It is equipped with signal processing and control functions, permitting all parameters to be set at the amplifier*. Further, settings data can be stored inside the amplifier and called up using the keys on the front panel.

The M-9000 is a Matrix Mixer Pre-Amplifier featuring the above matrix mixer function.
Besides the M-9000's matrix mixer function, the following A-9000 Series Amplifiers come with power amplifiers, out of which A-9060DH, A-9120DH, and A-9120DL can perform 2-channel or stereo broadcast in stand-alone operation.
A-9060DH: 60 W (70 V output) x 2
A-9120DH: 120 W (70 V output) x 2
A-9120DL: 120 W (4 Ω output) x 2
A-9060S: 60 W x 1
A-9120S: 120 W x 1
A-9240SH: 240 W (70 V output) x 1

* You can make setting data easily on the PC by using the Programming Software or the Excel file prepared as a utility tool for data setup; both are contained in the supplied CD-ROM.
  For data setup on the Programming Software and the Excel sheets, refer to the instruction manuals of "PROGRAMMING SOFTWARE" and "EASY DATA SETUP USING EXCEL SHEETS" also contained in the CD-ROM.

4. FEATURES

- Either matrix or mixer mode can be selected depending on application for optimum operation.
- Matrix mode is suitable for BGM broadcasts or paging to zoned areas.
- Mixer mode is suitable for speech or sound reinforcement in such applications as hotel meeting rooms, churches or conference rooms.
- Eight module slots enable audio input and output configuration ranging from 1 input and 1 output to 8 inputs and 8 outputs.
- All settings can be performed at the unit using the built-in vacuum fluorescent display (VFD), setting keys and Parameter setting knob on the front panel.
- Up to 32 settings can be stored as Event memory (in matrix mode) or as Scene memory (in mixer mode), which can be recalled by the unit or external connected equipment.
- An RS-232C port permits remote control of the unit using an AMX*1 or Crestron*2 controller, or similar external equipment.
- A key lock function prevents accidental changes of front panel key or knob operation.
- Volume adjustment, paging initiation, and BGM program selection can be easily remote-controlled. The optional C-001T module permits the number of control inputs and outputs to be increased.
- Paging calls can be performed by a PABX (extension telephone) with the use of the optional ZP-001T Zone Paging module.
- With the use of the optional AN-001T Ambient Noise Sensor Input module and AN-9001 Ceiling Mount Microphone, the amplifier's output volume can be automatically adjusted in response to the change in ambient noise level.
- Three operation methods are available in Matrix mode; Normal matrix operation, 1-channel output operation, and 2-channel output operation. Depending on the 9000 Series amplifier model and built-in modules, you can select either 1-channel output operation method that permits audio signals to be output only at the output channel 1, or 2-channel operation method that permits BGM broadcasts to be output at the output channel 1 and priority broadcasts at the output channel 2.
  Moreover, with the use of the optional ZP-001T and SS-9001 Speaker Selector, 1-channel or 2-channel broadcast can be made to 4 zones.
- The optional ZM-9001 Zone Manager adds 6 control inputs, while the optional ZM-9002 Zone Manager adds 4 control inputs and 1 volume control.
- A ducker function*3 permits paging calls to be made without interrupting BGM broadcasts when in matrix mode.
- Because an auto-mixing function (ducker function*3 and NOM attenuation function*4) is available when in mixer mode, the output gain can be automatically adjusted.

*1 AMX is a trademark of AMX Corporation.

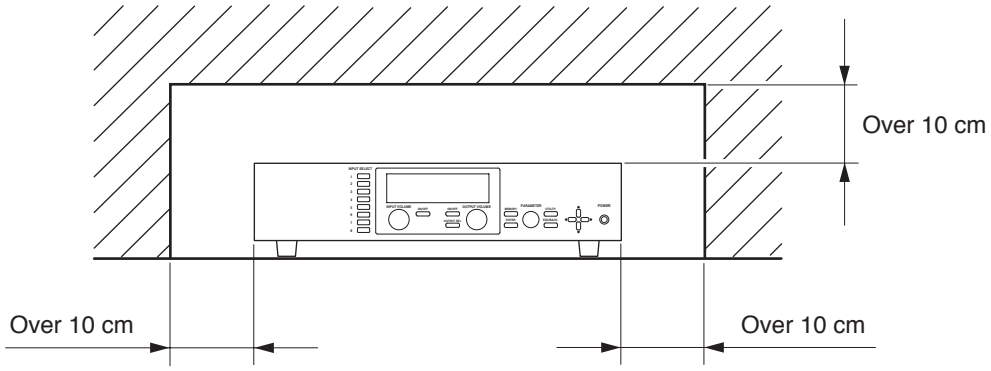
*2 Crestron is a trademark of Crestron Electronics, Inc.

*3 The Ducker function automatically attenuates input signals with lower priority when two or more audio signals are simultaneously received.

*4 The NOM (Number of Open Microphones) attenuation function automatically adjusts the output channel gain depending on the number of open microphones.

5. INSTALLATION PRECAUTIONS

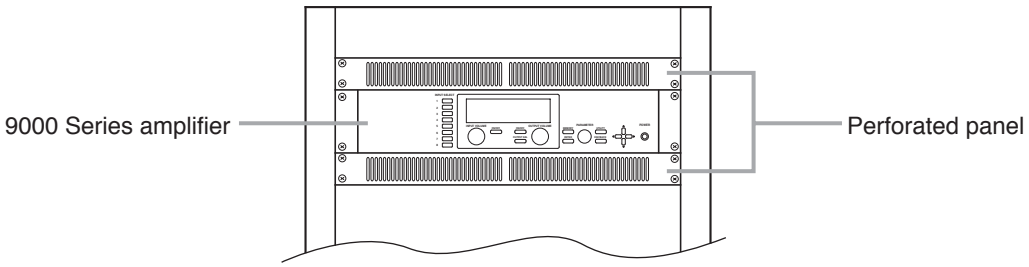
• Keep the 9000 Series Amplifiers except the M-9000 over 10 cm away from objects that may obstruct air flow to prevent the unit's internal temperature rise.



• When mounting the unit on an equipment rack

· Use the supplied rack-mounting bracket. (For the bracket attachment, refer to p. 103 "RACK MOUNTING BRACKET ATTACHMENT.")

· Have the unit well-ventilated, and be sure to mount a 1U or more size perforated panel above and below the unit to prevent the unit's internal temperature rise.



6. HANDLING PRECAUTIONS

• The supplied power supply cord is designed for exclusive use with this unit. Never use it with other equipment.

• Use the unit in locations where the temperature is between –10 and +40 °C (no condensation should be formed), and the humidity is less than 80%.

• The unit is a precision audio component. To prevent failure, avoid locations where it may be exposed to strong shocks or vibrations.

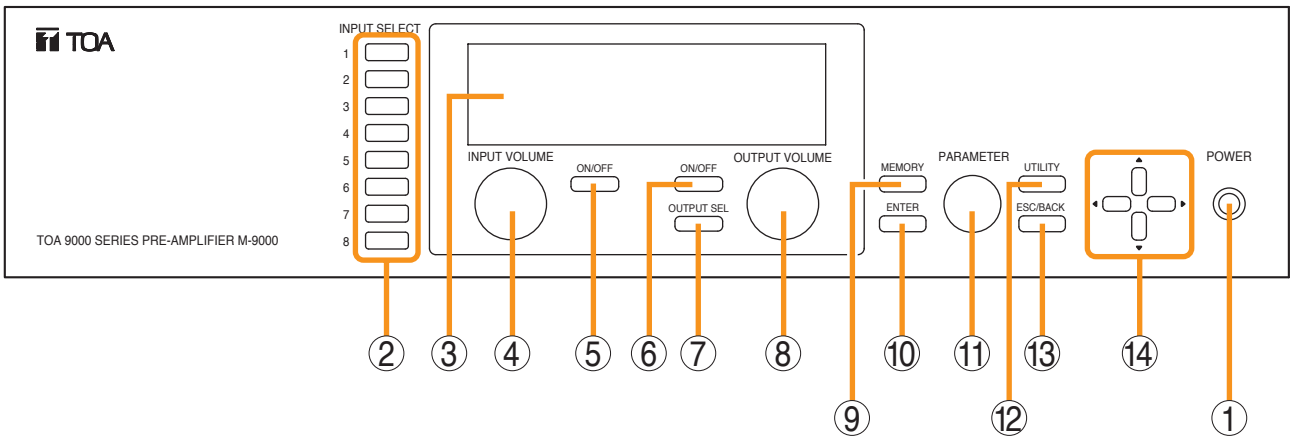
• To clean, be sure to first disconnect the power supply plug from the AC outlet, then wipe with a dry cloth. When extremely dirty, use a soft cloth dampened in neutral detergent. Never use benzene, thinner, alcohol or chemically-treated towels, which may damage the unit's finish.

7. NOMENCLATURE AND FUNCTIONS

7.1. M-9000 (Matrix Mixer Pre-Amplifier), A-9060DH/9120DH/9120DL/9060S/9120S/9240SH (Matrix Mixer Power Amplifiers)

[Front]

This figure represents the M-9000.



1. Power switch and Power indicator
Press this switch to turn on the power. The power indicator lights. To turn off the power, hold down the switch for at least 0.5 second.

Note
The power switch is a soft-switch, so the internal microcomputer is still operating even when the power switch is set to OFF.

2. Input channel selection keys
Select the input channel for which the volume is adjusted or parameter is set.
Pressing the key causes the corresponding red channel indicator to light on the vacuum fluorescent display (VFD).

3. Vacuum fluorescent display (VFD)
Displays the setting screen, input and output selection status, channel ON/OFF status, input and output level meter indication, and fader position.
(Refer to p. 13 "VFD on-screen indications.")

4. Input volume control
Adjusts the gain of the input channel selected with the input channel selection key (2).

5. Input channel ON/OFF key
Turns on or off the channel selected with the input channel selection key (2).

6. Output channel ON/OFF key
Turns on or off the channel selected with the output channel selection key (7).

7. Output channel selection key
Selects the output channel for which the volume is adjusted or parameter is set. The output channel indicators on the VFD light in sequence each time the key is pressed.

8. Output volume control
Adjusts the gain of the output channel selected with the output channel selection key (7).

9. Memory key
Used to save the setting contents in each setting mode, or to delete on-screen indications to enter each setting mode.

10. Enter key
Press this key when such indications as "OK?" are displayed.

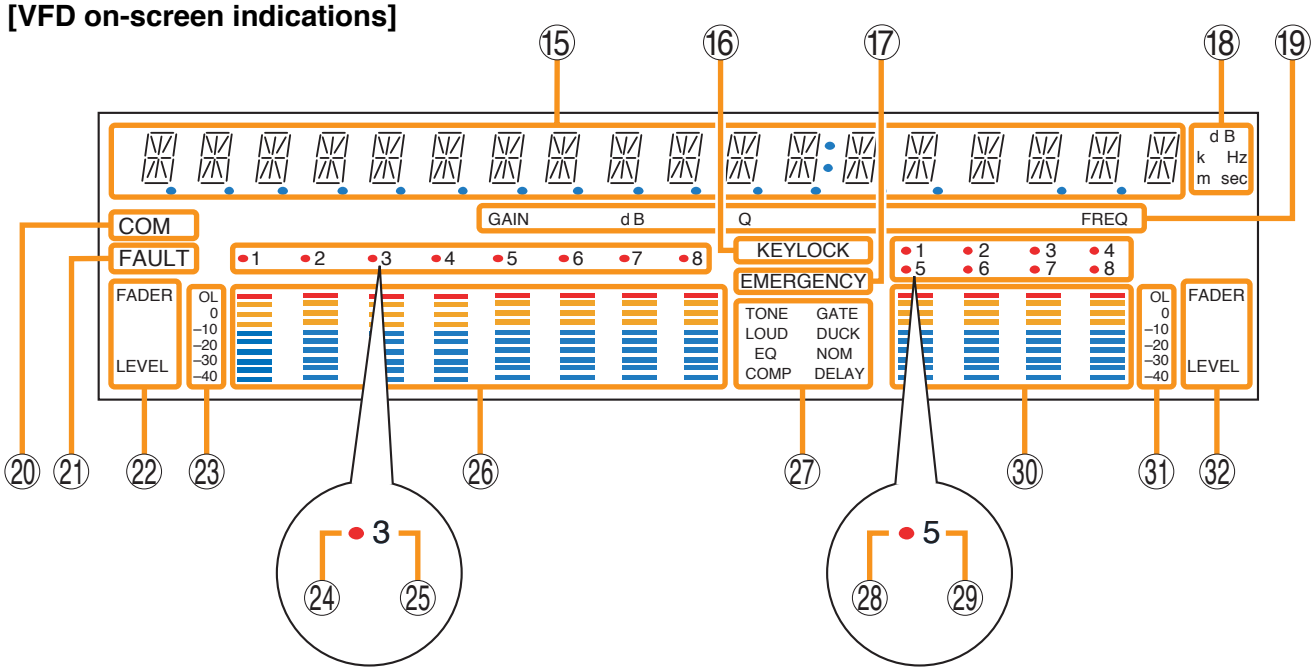
11. Parameter setting knob
Rotate this knob to select the setting item or setting contents.

12. Utility menu key
Holding down this key for 2 seconds or more when in normal operation mode switches the display to the setting screen.

13. Escape/Back key
Used to revert back to a previous screen when advanced with the Enter key during setting operation.

14. Screen shift keys [▲▼◀▶]
Move the setting screen or setting item.

[VFD on-screen indications]



15. 14-Segment,18-digit alphanumeric display
Displays the corresponding setting screen or data when each function key is pressed.
Parameters being edited flash.

16. Keylock indicator
Lights when the key lock function is enabled, and flashes while the key lock function is being edited.

17. Emergency indicator
Lights when the control input set for "Emergency mute" becomes active.

18. Unit indicator
Displays the unit of each parameter when it is set.

19. GAIN, dB, Q, FREQ indicators
Lights when the equalizer is adjusted.

20. COM indicator
Remains lit during communications via the RS-232C interface.

21. Fault indicator
Lights when the unit's failure or other abnormal conditions are detected.
(Refer to p. 119 "ERROR INDICATIONS.")

22. Input meter status indicator
Indicates which the input level (LEVEL) or input fader position (FADER) is being displayed on the input meter (26).

Note
Input level is displayed only when the D-001T/R module is used.

23. Input level indication
Scale of levels (in dB) for the input meter.

24. Input channel selection indicator (red dot)
Lights when the corresponding input channel is selected, and flashes while parameters are being edited.

25. Input channel ON/OFF indicator (channel number)
The indicators for all channels normally light regardless of whether or not the channels can be selected by the input channel selection keys (2) or can be used (p. 121 "Remarks"), while they flash when turned off by the input channel ON/OFF key (5).
The indicators of unused channels can be set to be off in the Utility setting item.

26. Input meter
Indicates the signal level or input fader position of each input channel.
Which the meter is indicating is displayed on the input meter status indicator (22).

Notes
- The input meter is kept on even for the channel that is turned off or muted.
- Input level is displayed only when the D-001T/R module is used.

27. Effect indicator
Lights when effect is on, and flashes while the parameters are being edited.

28. Output channel selection indicator (red dot)
Lights when the corresponding output channel is selected, and flashes while parameters are being edited.

29. Output channel ON/OFF indicator (channel number)

Lights when the corresponding output is on (i.e. in operation mode), and flashes when off.

The number of channels of which indicators light depends on the modules used.

30. Output meter

Indicates the signal level or output fader position of each output channel. Which the meter is indicating is displayed on the output meter status indicator (32).

Notes

- When the output channel 1 or 2 of the A-9060DH/9120DH/9120DL, or the output channel 1 of the A-9060S/9120S/9240SH is turned off or muted, the corresponding output channel's meter becomes off.
- Even when the output channel 2 of the A-9060S/9120S/9240SH, the M-9000's output channel 1 or 2, or the T-001T's output channel is turned off or muted, the output meter for these channels remains on.

31. Output level indication

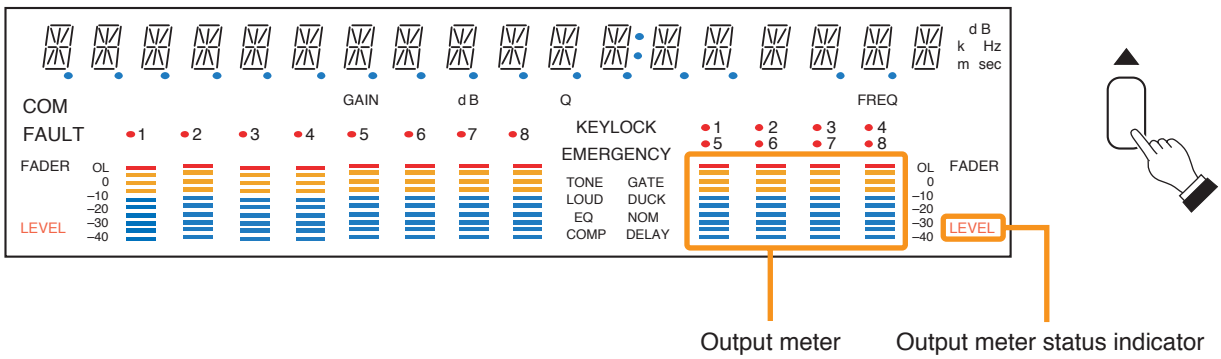
Scale of levels (in dB) for the output meter.

32. Output meter status indicator

Indicates which the output level (LEVEL) or output fader position (FADER) is being displayed on the output meter (30).

[Changing the indicated channels on the LEVEL output meter]

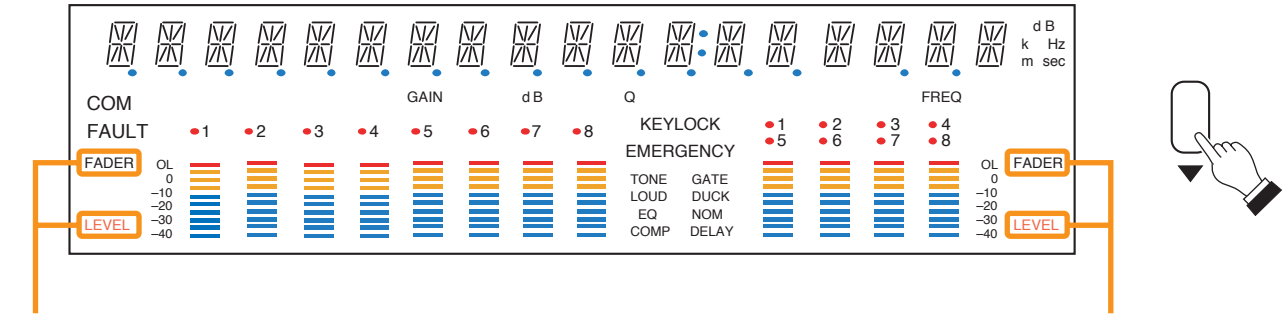
The output meter indicates the signal levels of only a set of 4 channels: CH 1 – 4 (factory-preset) or CH 5 – 8.
Pressing the Up shift key alternately switches the level indication between CH 1 – 4 and CH 5 – 8.
The LEVEL indicator of the output meter status indicator flashes while the CH 5 – 8 are indicated, and stays lit while the CH 1 – 4 are indicated.
In the same manner, the output meter also changes in the Fader indication.



Output meter Output meter status indicator

[Changing the input and output meter display status]

Pressing the Down shift key alternately switches the input and output meter display status between the signal level and the fader position.
The LEVEL indicators on both input and output meters light when the signal levels are indicated, while the FADER indicators light when the fader positions are indicated.

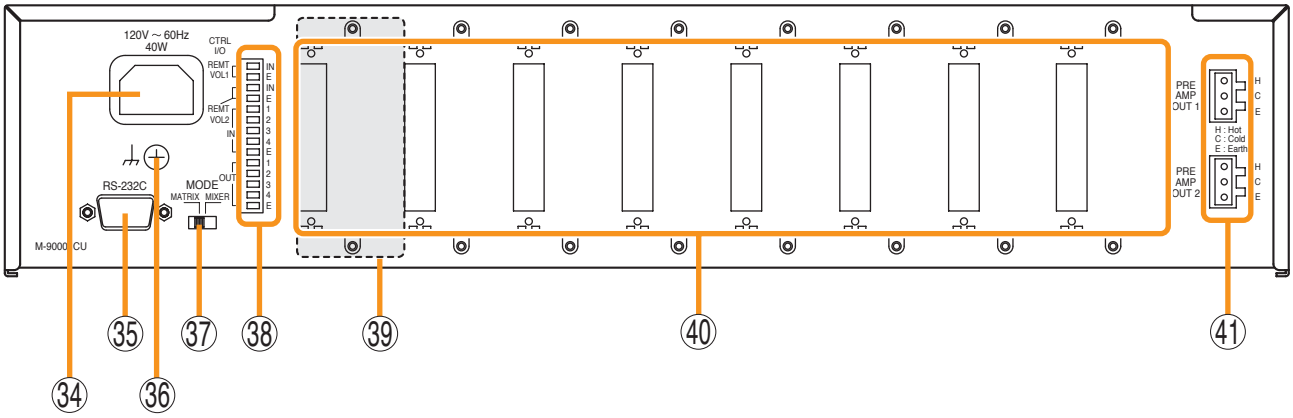


Input meter status indicator Output meter status indicator

Note: The figure above is the VFD screen display when the input and output levels are indicated.

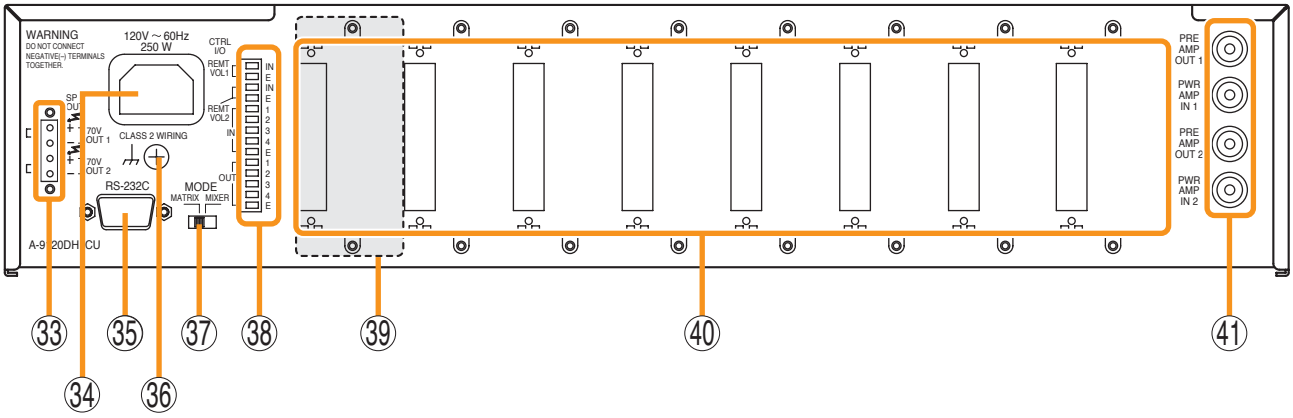
[Rear]

- **M-9000**



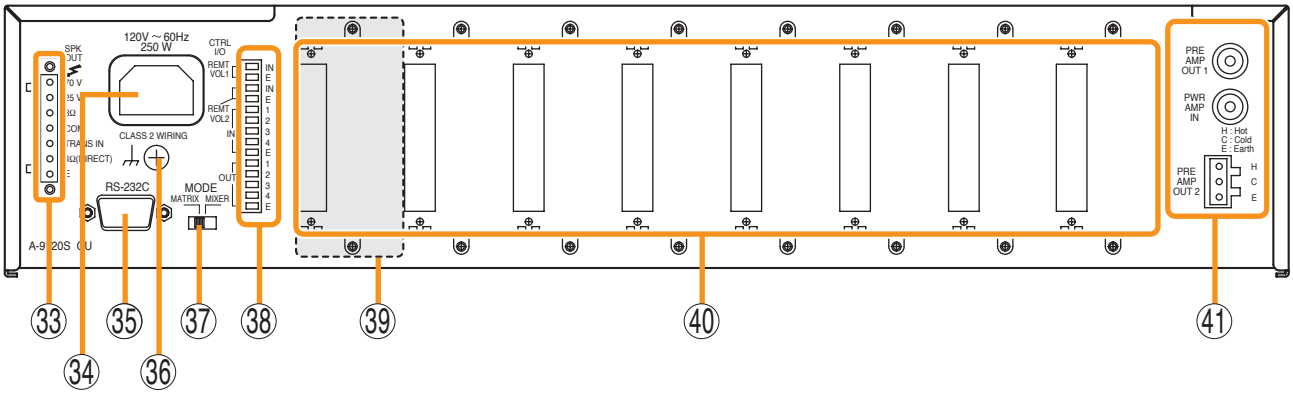
- **A-9060DH, A-9120DH, A-9120DL**

This figure represents the A-9120DH.

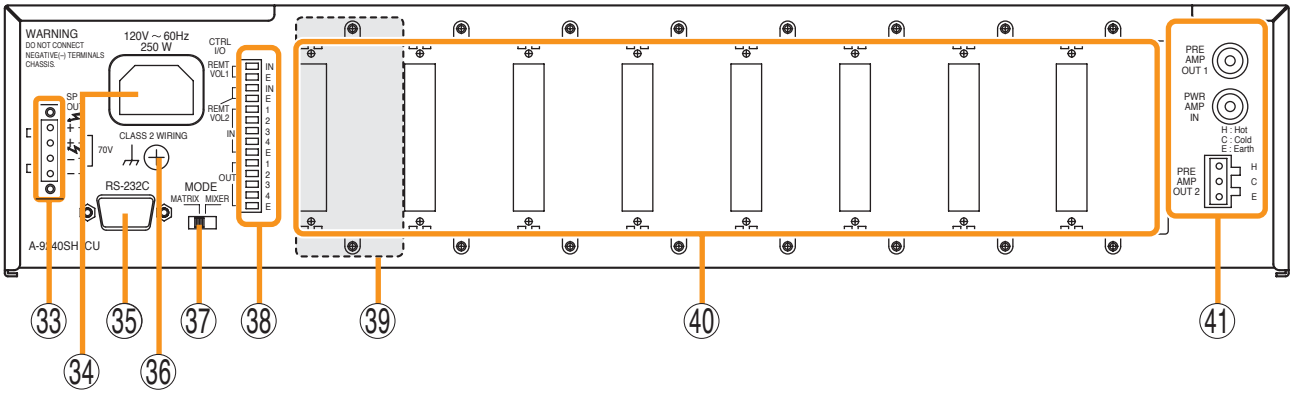


- **A-9060S, A-9120S**

This figure represents the A-9120S.



- **A-9240SH**



33. Speaker output terminal
Connects speakers of which total impedance matches the amplifier's output impedance.
(Refer to p. 96 "Speaker Output Terminal Connections.")

34. AC inlet
Connects the supplied power cord.

35. RS-232C serial communication port
Connector for communications with a personal computer or control equipment.

36. Functional earth terminal
Hum noise may be generated when external equipment is connected to the unit. Connecting this terminal to the functional earth terminal of the external equipment may reduce the hum noise.

Note: This terminal is not for protective earth.

37. Mode switch
Selects the unit's operation mode (either matrix or mixer).
The switch is factory-preset to the matrix mode.

38. Control-I/O connection terminal
Connect a 10 kΩ (linear taper) variable resistor or input the DC voltage of 0 to +10 V to the remote volume control terminals (REMT VOL 1 and 2) when remotely adjusting the volume.
To perform other remote control operation, connect the ZM-9001 or ZM-9002 Zone Manager.
Input and output terminals (IN and OUT) are used to change the unit's internal status or output internal status data to external equipment after having received various control signals.

39. Blank panel (accessory)
Attach the blank panels to open slots.

40. Module slots
900 Series or 9000 Series modules can be inserted into these slots.
(Refer to p. 89 "MODULE INSTALLATION.")

41. Preamplifier output and Power amplifier input terminals

[M-9000]
There are 2 preamplifier output terminals.
For unbalanced connection, connect the unit's Hot and Earth terminals to the connected equipment's Signal and GND terminals, respectively. (Leave the unit's Cold terminal free.)
0 dB, 600 Ω, balanced type

[A-9060DH/9120DH/9120DL]
There are 2 preamplifier output terminals and 2 power amplifier input terminals.
Connecting a plug to the power amplifier input terminal internally disconnects the preamplifier section from the power amplifier section.
Both terminals: 0 dB, 300 Ω, unbalanced type

[A-9060S/9120S/9240SH]
There are 2 preamplifier output terminals and 1 power amplifier input terminal.
Connecting a plug to the power amplifier input terminal internally disconnects the preamplifier section 1 from the power amplifier section.
To make unbalanced connection to the preamplifier output 2, connect the output's Hot and Earth terminals to the external equipment's Signal and GND (or Earth) terminals, respectively.
(Leave the output's Cold terminal open.)
Preamplifier output 1: 0 dB, 300 Ω, unbalanced
Preamplifier output 2: 0 dB, 600 Ω, balanced

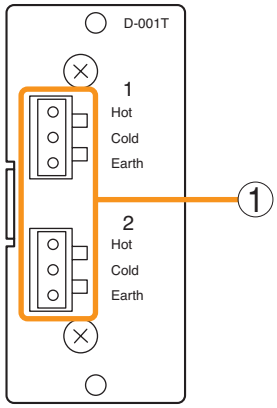
7.2. Optional Modules

7.2.1. D-001T and D-001R (2-Channel Input Modules)

The D-001T and D-001R modules are designed for use with the 9000 Series amplifiers.
Up to 4 modules (8 channels in total) can be inserted into the amplifier.
Both modules can handle signals ranging from microphone level (–60 dB) to line level (–10 dB) in 9 input sensitivity levels. They have an internal digital signal processor that can process input signals.
The D-001T can supply phantom power (24 V).

The D-001T or D-001R is required to use a VOX (Voice Operated Exchange) function and input channel level meter.

[D-001T]

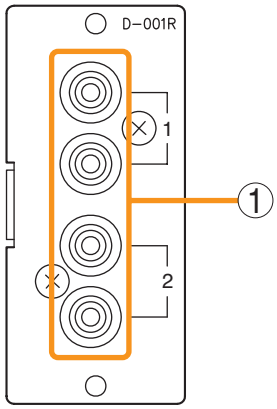


[D-001T]

1. Monaural input terminals [1, 2]

Electronically-balanced input terminals.
Type of connector: 3P removable terminal blocks
Input level: –60 dB to –10 dB selectable
Input impedance: 10 kΩ when the phantom power is OFF, and 3 kΩ when ON

[D-001R]



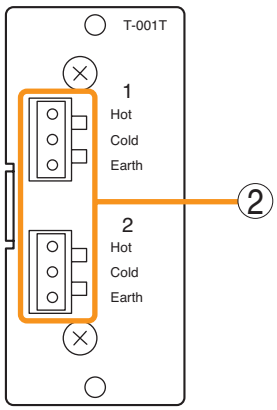
[D-001R]

1. Monaural input terminals [1, 2]

Unbalanced input terminals.
Type of connector: RCA jacks
Input level: –60 dB to –10 dB selectable
Input impedance: 10 kΩ
Two inputs of each channel are mixed.

7.2.2. T-001T (Audio Output Expansion Module)

The T-001T module is designed for use with the 9000 Series amplifiers and can expand 2 output channels per module.
Since the main unit has 2 fixed outputs, the audio output can be expanded to 8 channels by using a maximum of 3 modules (6 channels).



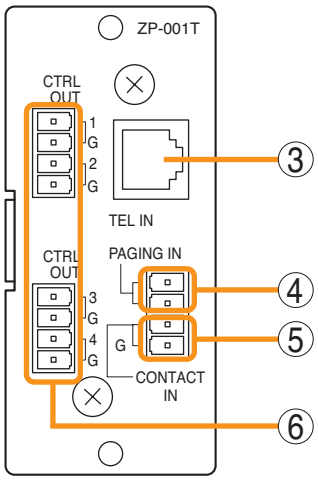
2. Monaural output terminals [1, 2]

Electronically-balanced 3P removable terminal blocks.
Output level: 0 dB
Output impedance: 600 Ω
For unbalanced connection, connect the unit's Hot and Earth terminals to the connected equipment's Signal and GND terminals, respectively. (Keep the unit's Cold terminal free.)

7.2.3. ZP-001T (Zone Paging Module)

The ZP-001T module is designed for use with the 9000 Series amplifiers and functions as an interface to connect the 9000 Series amplifiers to an analog PABX, allowing zone paging to be initiated from the PABX. Only one ZP-001T module can be used per 9000 Series amplifier.

There are two operation modes: Ring signal and Paging port modes. Select one of the two modes when using this module.
The operation method differs depending on the set operation mode. (Refer to p. 31 "Zone Paging.")



3. Telephone input terminal [TEL IN] (Modular jack)
Interface connector for an analog PABX.
Connect a PABX to this terminal when using the module in the ring signal mode.

4. Paging input terminal [PAGING IN]
4-pin removable terminal block, 2 pins are used for this input.
This terminal is used to connect a PABX in the paging port mode.

5. Control input terminal [CONTACT IN]
4-pin removable terminal block, 2 pins are used for this input.
Connect the contact output from a PABX to this terminal.

6. Control output terminals [CTRL OUT 1 G, 2 G, 3 G, 4 G]
4-pin removable terminal blocks, control output terminals.
Connect these terminals to the control input terminal of the SS-9001 Speaker Selector.

[Requirements of the PABX to be connected to the ZP-001T]

- The PABX shall be complaint with TIA/EIA-464-B standard.
- Specifications or conditions required in each of the following modes shall be satisfied:

Note: The ZP-001T may malfunction if the connected PABX does not meet the above requirements.

(A) When using the module in the Paging port mode
- Connection: Line level paging port
- Signaling method: DTMF (The module cannot be operated with dial pulse.)
- Shall provide no-voltage make contact during paging calls.
- Insensitive to whether loop voltage exists or not, and whether polarity of the loop voltage is reversed or not when a line connection is established.

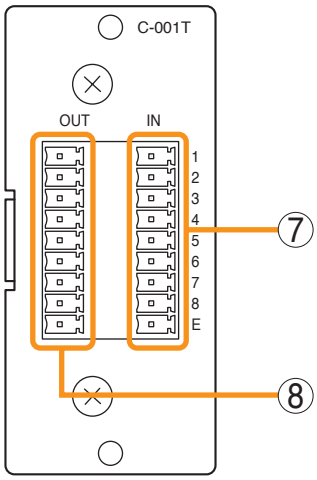
Note
If the PABX does not meet the above requirements, use the D-001T/R module and set the trigger to "VOX" (Voice Operated Exchange) to initiate paging. In this case, the paging output channel cannot be selected, which differs from the operation by the ZP-001T.

(B) When using the module in the Ring signal mode
- Connection: Analog two-wire extension line, loop start
- Signaling method: DTMF (The module cannot be operated with dial pulse.)
- Reorder tone: 120 IPM (impulses per minute) or less
- Loop voltage: 24 V DC or more (polarity insensitive), which should be supplied from the PABX.
- Insensitive to whether polarity of the loop voltage is reversed or not at a call from the PABX.*
- Loop voltage supply shall not be cut off from the beginning of a call to the reorder tone out.*
- The state of CPC (Calling Party Controlled) break or "Open Loop Disconnect" shall be reset at the PABX.*

* Note that there is no need to meet these requirements provided that the ZP-001T's control input terminals are kept closed. However, noise may be output if the line is physically disconnected during a paging call because the ZP-001T cannot recognize the line cutoff nor stop output for 30 seconds after paging initiation.

7.2.4. C-001T (Control I/O Expansion Module)

The C-001T module is designed for use with the 9000 Series amplifiers and can provide up to 8 channels each of input and output expansion.
Since the main unit has 4 fixed inputs and outputs each, the control input and output can be expanded to up to 12 channels each when the C-001T module is used.

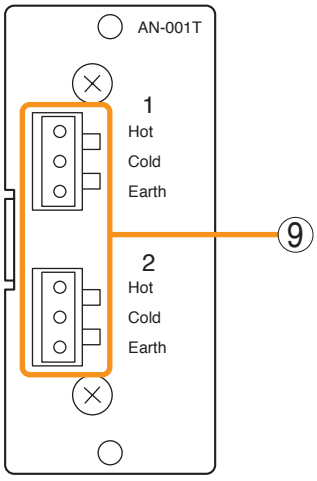


7. Control input terminal [IN 1, 2, 3, 4, 5, 6, 7, 8, E]
9-pin removable terminal block, 8-circuit control input terminal.
Individual input functions are assigned on the front panel setting screen of the main unit.

8. Control output terminal [OUT 1, 2, 3, 4, 5, 6, 7, 8, E]
9-pin removable terminal block, 8-circuit control output terminal.
Individual output functions are assigned on the front panel setting screen of the main unit.

7.2.5. AN-001T (Ambient Noise Sensor Input Module)

The AN-001T module is designed for use with the 9000 Series amplifiers and automatically adjusts the amplifier's output volume in response to the change in ambient noise level.
Maximum 2 AN-001T modules (4 channels in total) can be used per 9000 Series amplifier.
It can handle signals from microphone level (–60 dB) to line level (–10 dB) by controlling the gain in 9 steps.
Phantom power (+24 V) can be supplied to a condenser microphone.
The AN-001T's inputs are for detecting ambient noise level and cannot be used as normal audio inputs. Ambient noise fed to the inputs can be monitored when the monitor function is set to ON in the Input setting flow.

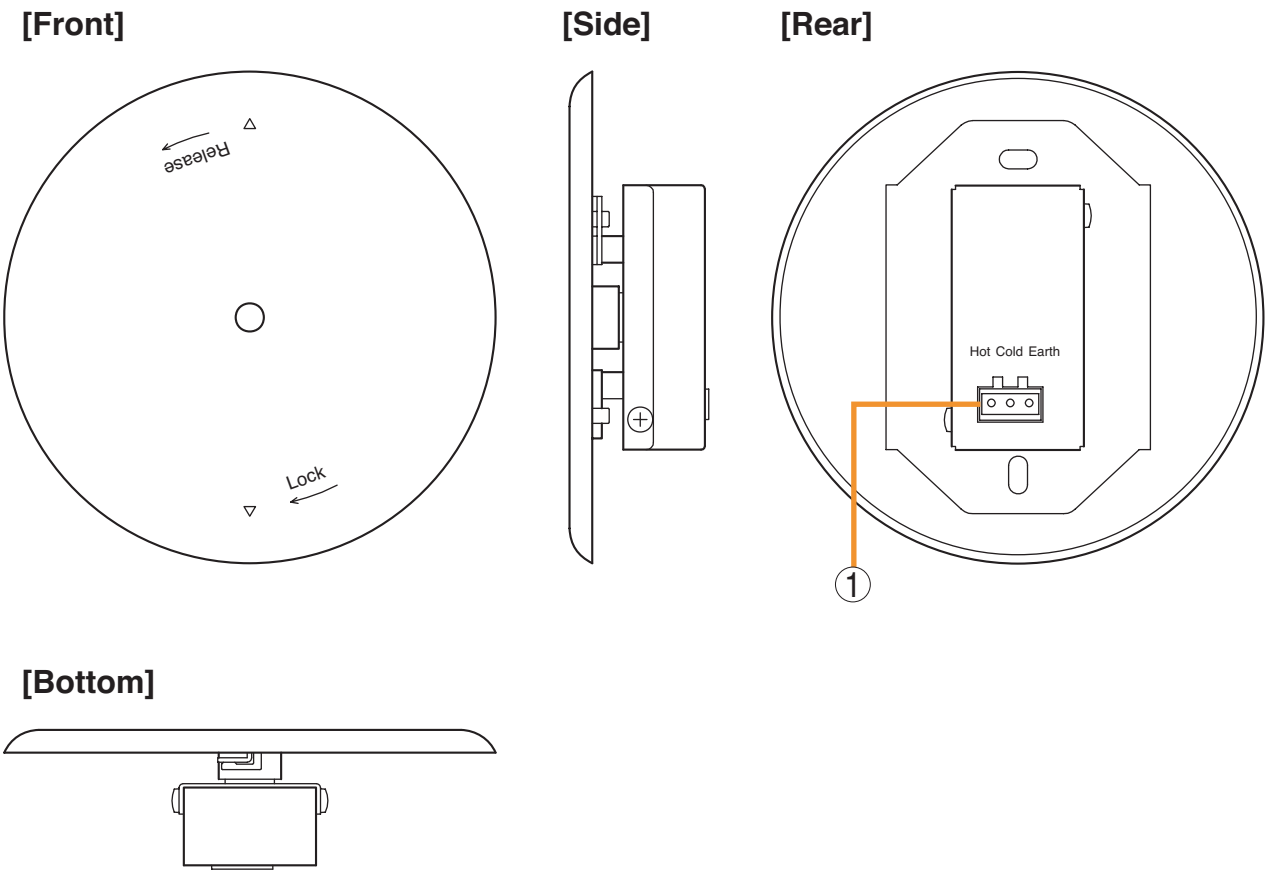


9. Monaural input terminals [1, 2]
Electronically-balanced 3P removable terminal blocks.
Input level: –60 dB to –10 dB selectable.
Input impedance is 10 kΩ when the phantom power is OFF, and 3 kΩ when ON.

7.3. Optional Accessories

7.3.1. AN-9001 (Ceiling Mount Microphone)

The AN-9001 is designed to be mounted in a wall or ceiling with the use of a 1-gang electrical box.
It is used in conjunction with the AN-001T Ambient Noise Sensor Input module in the 9000 Series system.



1. Microphone output terminal [Hot, Cold, Earth]
Electronically-balanced 3P removable terminal block.
Sensitivity: –5 dB (1 kHz, 0 dB=1 V/Pa)
Output impedance: 200 Ω

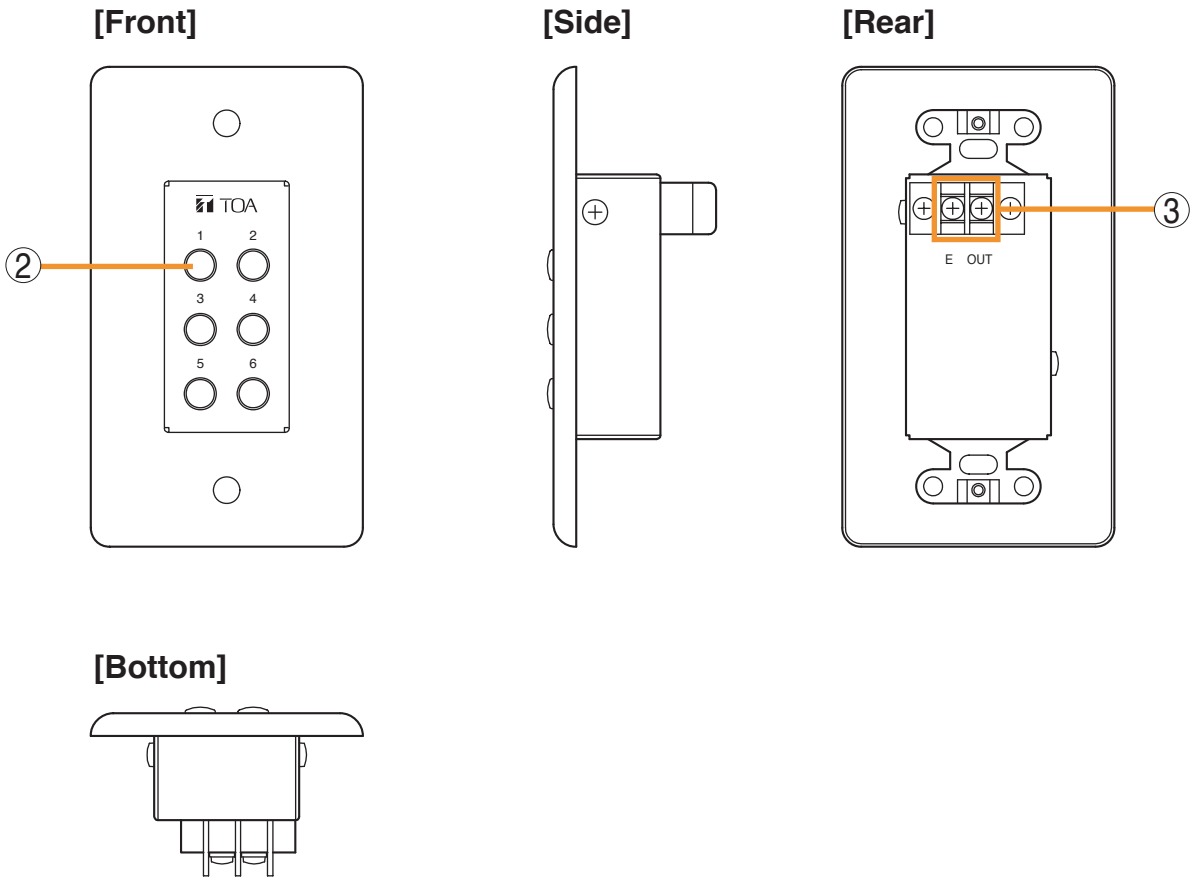
Note

In designing the layout of the AN-9001, pay particular attention to the following points so that the AN-9001 and AN-001T in combination can function effectively.

- Position the AN-9001 fully away from the speaker to be used for zone announcement. Doing otherwise may cause the AN-9001 to detect the speaker sound as noise, failing to keep the optimum sound level.
- Do not position the AN-9001 near the equipment that constantly generates loud noise. If positioned, the AN-9001 will respond to such loud noise, failing to respond to the change in ambient noise level.

7.3.2. ZM-9001 (Zone Manager)

The ZM-9001 adds 6 control inputs and can be mounted in a 1-gang electrical box.

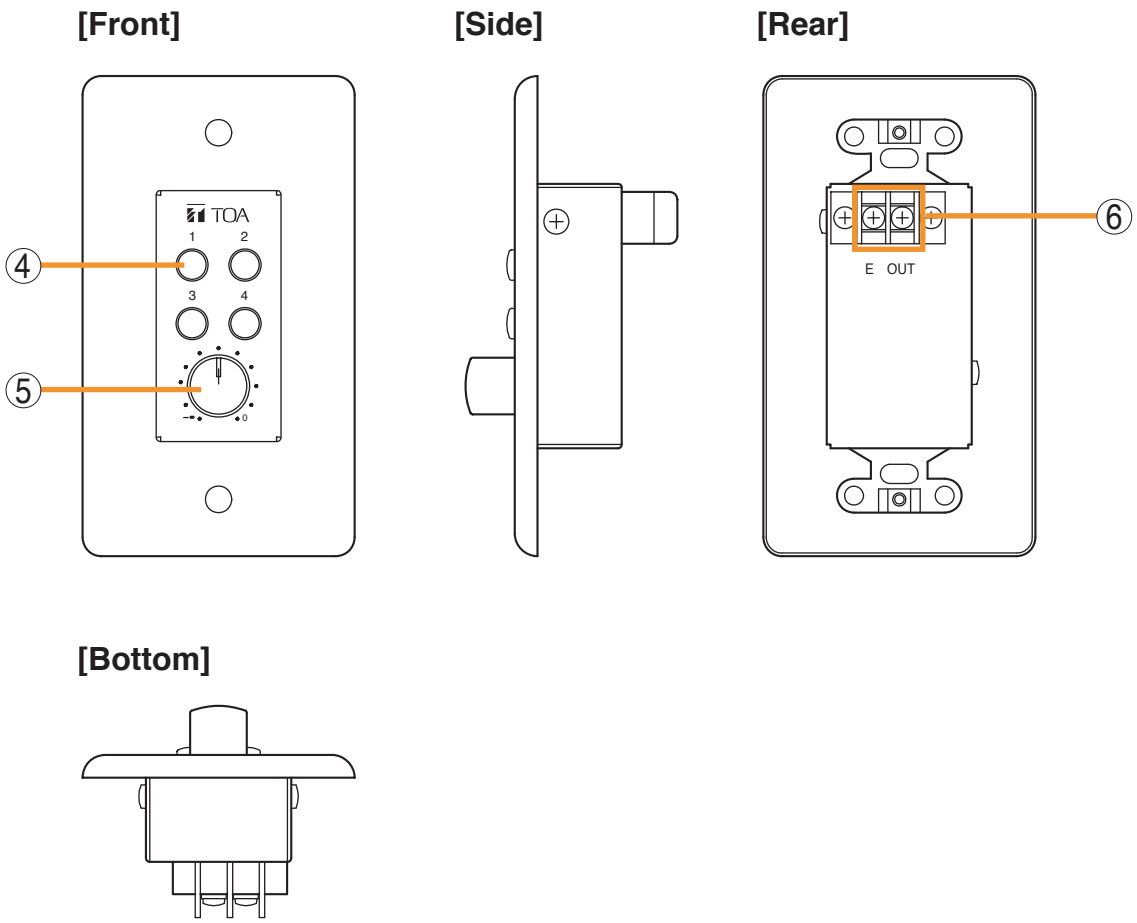


2. Control buttons [1 – 6]
Activate the function assigned to them when pressed.

3. Control output terminal [E, OUT]
Connect this terminal to the 9000 Series amplifier's REMT VOL terminal.
Use a shielded cable with 50 Ω or less line resistance (per line) for this connection.
Avoid installation of this cable and power cables in the same conduit. Separate piping.

7.3.3. ZM-9002 (Zone Manager)

The ZM-9002 adds 4 control inputs and 1 volume control, and can be mounted in a 1-gang electrical box.



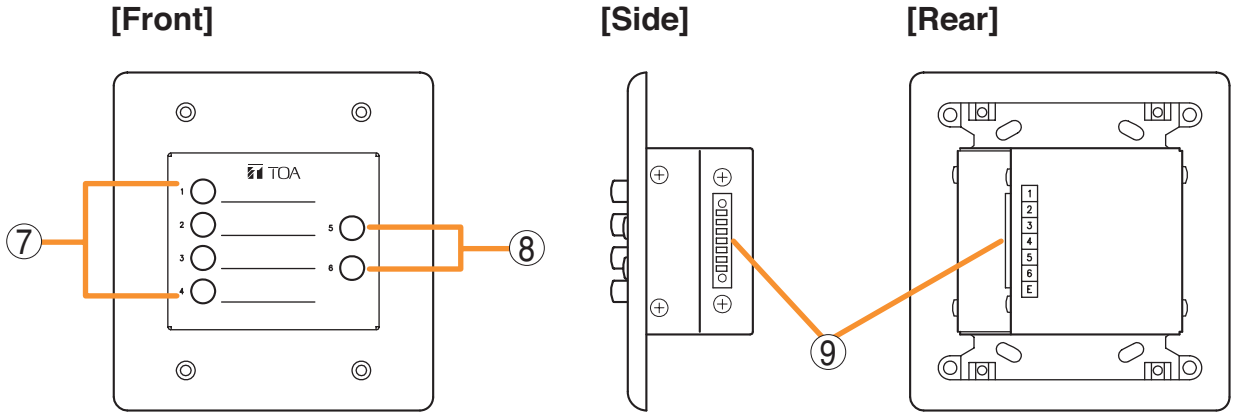
4. Control buttons [1 – 4]
Activate the function assigned to them when pressed.

5. Volume control
Adjusts the volume on the assigned input or output channel.

6. Control output terminal [E, OUT]
Connect this terminal to the 9000 Series amplifier's REMT VOL terminal.
Use a shielded cable with 50 Ω or less line resistance (per line) for this connection.
Avoid installation of this cable and power cables in the same conduit. Separate piping.

7.3.4. ZM-9003 (Zone Manager)

The ZM-9003 is a remote control switch panel with 4 interlocking selection switches and 2 momentary switches. Connecting it to the 9000 Series amplifier's control input terminal permits various controls such as BGM source selection and the sound volume adjustment.
It can be mounted in an American standard 2-gang electrical box in a wall.



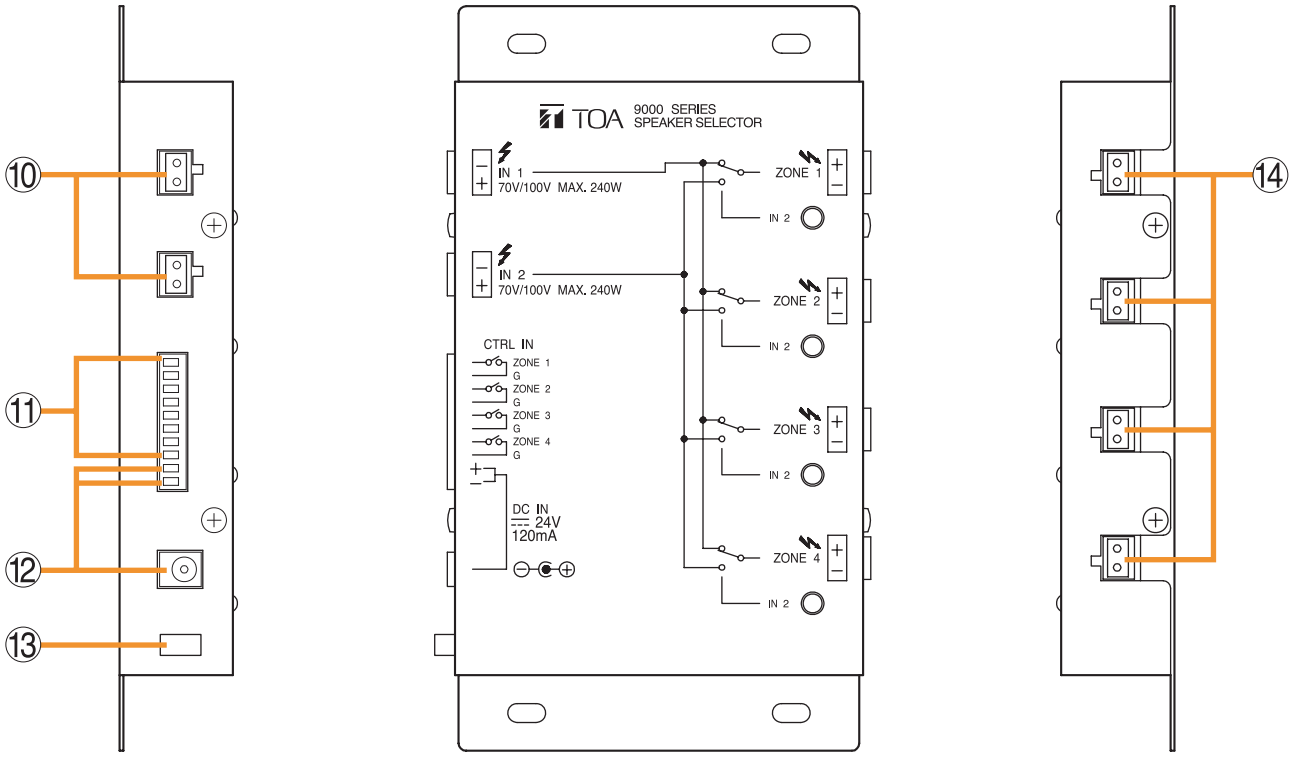
7. Interlocking selection switches [1 – 4]
Activate the function assigned to them when pressed.

8. Momentary switches [5, 6]
Activate the function assigned to them when pressed.

9. Control output terminal [1 – 6, E]
Connect this terminal to the 9000 Series amplifier's control input terminal.
Use a cable with 250 Ω or less line resistance (per line) for this connection.
Avoid installation of this cable and power cables in the same conduit. Separate piping.

7.3.5. SS-9001 (Speaker Selector)

The SS-9001 selectively distributes each of 2 inputs to the same 4 output zones.
It is used in conjunction with the ZP-001T Zone Paging module.



10. Speaker input terminals [IN 1, IN 2]
2-pin removable terminal blocks.
Connect the speaker output (high impedance line, up to 240 W) from the power amplifier to each terminal.
Short the IN 2 terminal's pins when only the IN 1 terminal is used.

11. Control input terminal [CTRL IN]
8 pins in the 10-pin removable terminal block.
Receives the control signals (polarized non-voltage contacts) from the ZP-001T in the Matrix "Sub-Mode" (single output or BGM/PAGE), and activates the inner relays.
This terminal can also receive control signals from the control output terminals of the 9000 series amplifier or C-001T Control I/O Expansion Module.

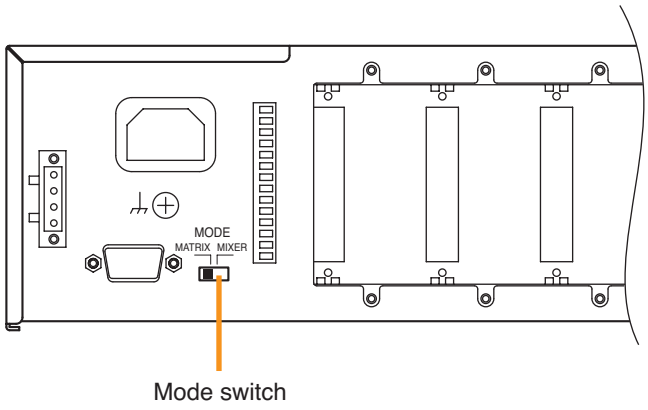
12. DC power input terminals [DC IN]
Requires the power input of 24 V DC.
DC input terminal or 2 pins in the 10-pin removable terminal block.
Connect the power source that can supply 200 mA or more to this terminal.
The optional AD-246 AC Adapter can be used for the power supply.

13. Cord clamp
Fixes the AC adapter's power cord. (p. 101 "Power Source Connections to the SS-9001")

14. Speaker output terminals [ZONE 1/2/3/4]
2-pin removable terminal blocks.
Connect speakers to each terminal, which is capable of delivering 240 W output on a line.

8. DESCRIPTION OF MATRIX MODE

Two operation modes are made available to the unit: Matrix mode and Mixer mode.
Be sure to select the matrix mode by the Mode switch on the rear panel before using the unit.
(The mode switch is factory-preset to the mixer mode.)



Important

Be sure to disconnect the power supply plug from the AC outlet when changing the mode.
Since the changes in mode will erase all setting contents, download the set files that need to be stored using the supplied PC software.

This manual describes the instructions on the unit set for the Matrix mode. When you use the unit in the Mixer mode, please read the separate installation and operating instructions for the mixer mode.

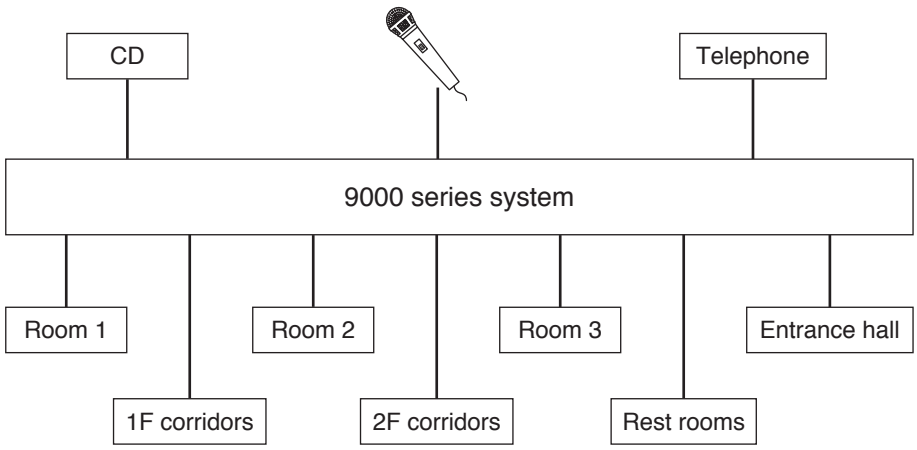
8.1. General Description

Use the matrix mode when broadcasting BGM or paging calls to zoned areas in such facilities as civic centers, universities, schools, restaurants, bars, and cruise ships.
Input signals are basically not mixed but distributed in the matrix mode.
Three operation methods are available in this mode; Normal matrix operation, 1-channel output operation (A-9060S/9120S/9240SH only), and 2-channel output operation (BGM/Page operation) (A-9060DH/9120DH only). (Refer to p. 36 "SELECTING OPERATION METHOD.")

8.1.1. Normal matrix operation

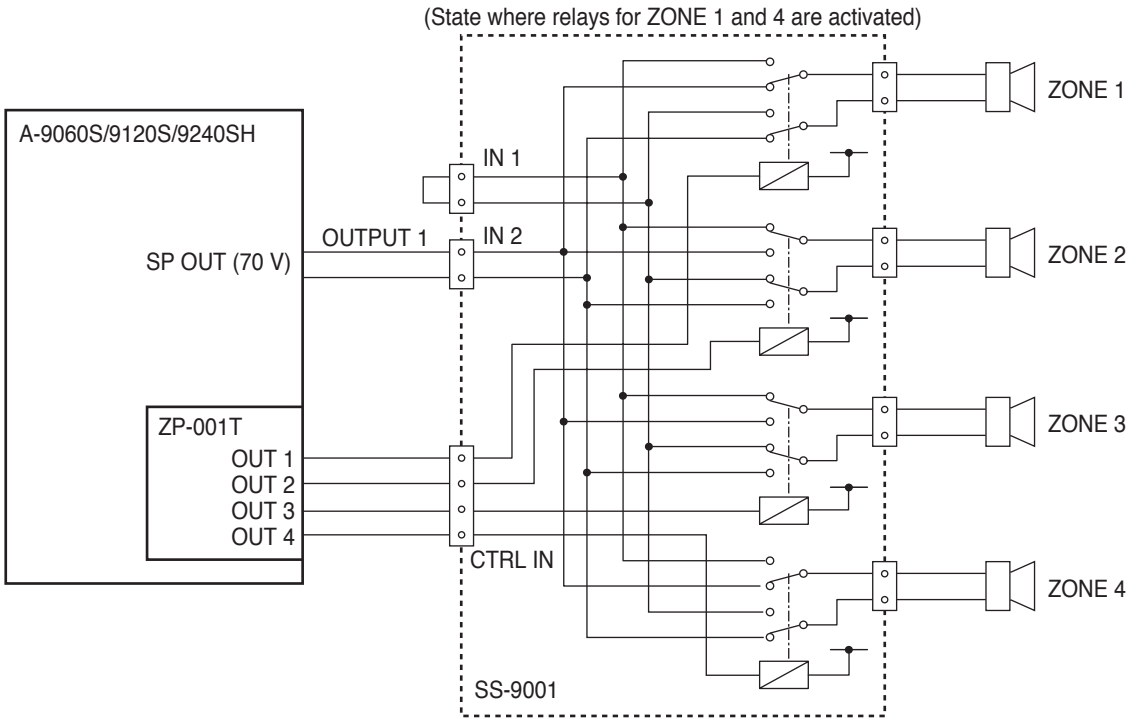
In the normal matrix operation method, multiple audio input signals can be simultaneously routed to multiple outputs and in addition, paging calls assigned different priority levels can be initiated during BGM broadcast to each zone.
The ducker function (refer to p. 28 "Glossary") also allows paging calls to be made without interrupting BGM broadcasts to each zone.
A maximum of 32 settings related to broadcasts, such as broadcast sound source input channels, interrupt broadcast output channels, BGM source input channels, and broadcast start methods, can be stored as Event memory.

[Application example for a civic center]



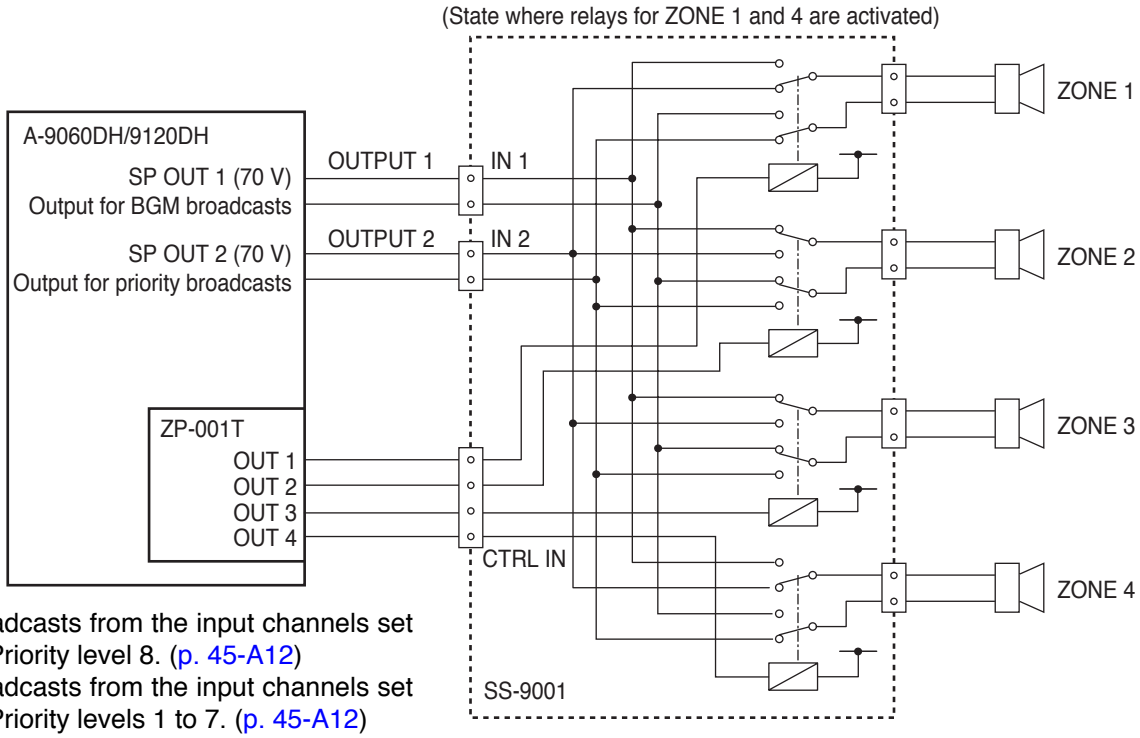
8.1.2. 1-channel output operation

This operation method can be selected when the A-9060S, A-9120S, or A-9240SH Amplifier without T-001T Audio Output Expansion module installed is used. Audio signals are delivered only at the amplifier's output channel 1. Paging calls and BGM broadcasts are made on the basis of the priority levels set for input channels. In conjunction with the optional ZP-001T Zone Paging module and the optional SS-9001 Speaker Selector, the output channel 1's signals can be distributed to 4 zones.



8.1.3. 2-channel output operation (BGM/Paging operation)

This operation method can be selected when the A-9060DH or A-9120DH Amplifier with ZP-001T Zone Paging module but without T-001T Audio Output Expansion module installed is used. BGM broadcasts*1 are delivered at the amplifier's output channel 1 and priority broadcasts*2 at the output channels 2. Priority broadcasts are based on the priority levels set for input channels. BGM broadcasts are always made to all zones as long as no priority broadcasts are made.



*1 Broadcasts from the input channels set for Priority level 8. (p. 45-A12)

*2 Broadcasts from the input channels set for Priority levels 1 to 7. (p. 45-A12)

8.2. Glossary

- **ANC (Ambient Noise Control) function (AN-001T only)**

The ANC function automatically adjusts the amplifier's output volume in response to the change in ambient noise level.
The output volume changes as the ambient noise level goes above or below the set reference level.

- **Ducker function**

The Ducker function automatically attenuates input signals with lower priority when two or more audio signals are simultaneously received. This function cannot be used if any of such received inputs is not set for the Ducker function.

- **VOX (Voice Operated Exchange) function (D-001T and D-001R only)**

This function activates the set Event when an audio signal is input. No Event is activated when no input signal exists. If the audio signal drops below a preset level after the VOX function begins operation (i.e. after an audio signal is fed into the module), the set Event is terminated after approximately 5 seconds.

- **Event**

An "Event" is the unit that defines broadcast pattern and up to 32 Events can be stored.
When operating the system in the matrix mode, be sure to preset the Event to complete the Route settings.

- **Event classification**

[ROUTE]
This setting defines which audio input signal is transmitted to which audio output. Multiple outputs can be selected. Input channels set to priority levels 1 – 7 are for priority broadcasts, while the input channel set to priority level 8 is for BGM broadcasts. Set Trigger to "None," "VOX" (D-001T and D-001R only) or "Control Input" (1 – 12). Selecting Control Input for Trigger causes BGM broadcasts to be activated by pulse trigger, and priority broadcasts to be operated by level trigger. It is possible to synchronize control inputs and control outputs, with output being produced as long as the Event is activated.
To terminate the BGM Event (priority 8) in progress, it is necessary to make the "BGM END" setting (refer to the item below) and to activate the BGM END.
Unlike other Events* with priorities 1 – 7, the BGM Event with priority 8, once activated, is not terminated until the BGM End is activated.

* These Events are terminated in any of the following cases:
  - If an Event is activated at the control input terminal or by the VOX function, this Event is terminated when the activation trigger is turned off.
  - If an Event is activated by the ZM-9001 or ZM-9002, this Event is terminated when the control input terminal set for "BUSY-IN" is turned off.
  - When Events with higher priority level override all output channels of the Event in progress, this forcibly terminates the original Event.

[BASE]
In this setting, multiple BGM Events are combined into one Base pattern so that they are simultaneously activated by means of a single activation signal. To use this function, BGM Events (signal routing from input to output) must be preset in the Route settings.
Up to 4 Route-set BGM Events can be combined into one Base pattern.

Example: Combining Route-set BGM Events Nos. 1, 2 and 3 into one Base pattern, and assigning the Base pattern to Event No. 4

When BGM Events to which the same output channel is assigned are individually activated, their broadcast zone depends on the priority setting (first-in-first-out priority, last-in-first-out priority, or mixing) performed in advance for the Events.
Though BGM Events combined in a BASE pattern are activated simultaneously, the BGM Event with the smallest input channel number is considered to have been selected first.

Example: Assigning the following two BGM Events to Event No. 3 as Base pattern.

Event 1 = Input 1 → Outputs 1 and 2
Event 2 = Input 2 → Outputs 2 and 3

In this example, Output 2 is duplicated. However, if system priority is set for "first-in-first-out" priority, BGM is broadcast to the following zones because Input 1 has a priority:

Event 1 = Input 1 → Outputs 1 and 2
Event 2 = Input 2 → Output 3

(Continued to the next page)

For Trigger, select "None" or "Control Input" (1 – 12). In Base settings, VOX cannot be selected for Trigger nor can control outputs be synchronized with control inputs. Base settings are not required when only one BGM program has been set in Route.

- **BGM END**

  Defines the method of stopping BGM broadcasts. Only "Control Input" (1 – 12) can be selected for Trigger.
  All current BGM broadcasts are stopped. Control outputs cannot be synchronized with control inputs.
  To stop the specified BGM Event set in Route (including the case that the only one Base pattern is broadcast) when two or more BGM Events are activated, turn off the corresponding input channel at the unit's front panel.

9. OPERATION

To operate the unit in the matrix mode, make necessary settings in advance such as the audio input/output settings and event settings (including broadcast pattern and BGM broadcast group) according to the set operation method.

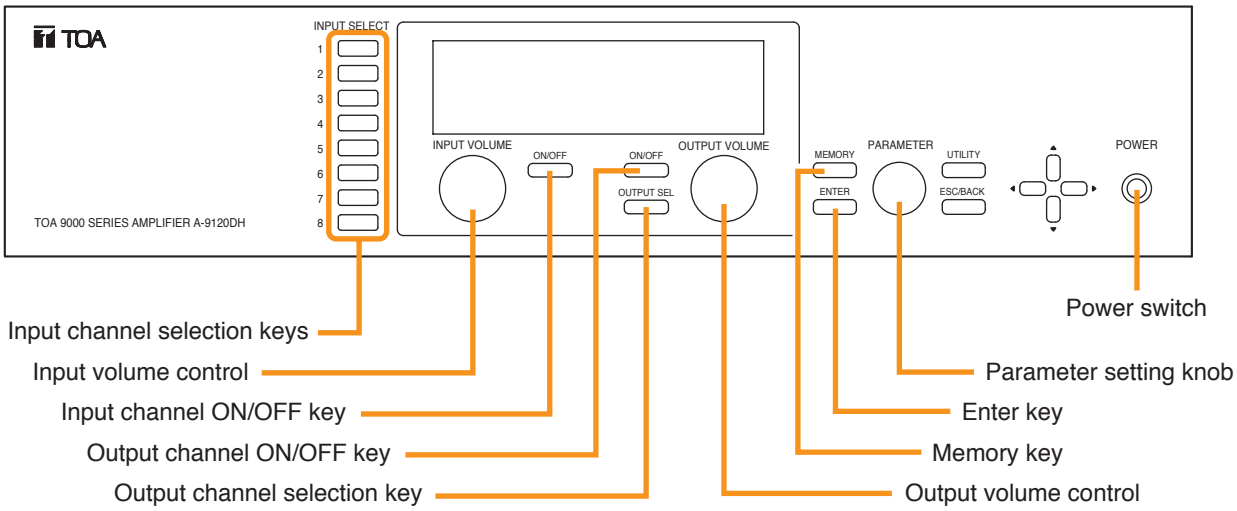
9.1. Normal Use

In the matrix mode, the unit need not be manually operated in normal conditions since the set broadcast patterns can be activated by means of remote control. However, it is also possible to adjust the volume, activate the broadcast patterns directly, or turn on or off input/output channels using the front panel-mounted keys and knobs.
This section describes operations that can be performed in normal use when the key lock function is disabled and the unit is set to the matrix mode.

9.1.1. Keys and knobs

[Front]

This figure represents the A-9120DH.



9.1.2. Power ON/OFF

Power is turned on when the power switch is pressed.

To turn off the power, hold down the power switch for 0.5 second or more.

Note
The power switch is a soft-switch, so the internal microcomputer is still operating even when the power switch is set to OFF.

9.1.3. Changing the input volume

Step 1. Press the Input channel selection key to choose the input channel for which you want to change the volume from those with the illuminated Input channel ON/OFF indicator (channel number).
The selected channel's selection indicator (red dot) lights, and the channel name and volume level are displayed on the VFD screen.

Step 2. Adjust the volume using the input volume control.

Tip
Whether the changed volume is saved or not depends on the setting item "Memory erasure or storage" in the UTILITY setting on page 60-C21.

Step 3. After completing adjustments, press the Memory key.
The channel selection indicator extinguishes and the on-screen indication disappears.

Note
You cannot perform the Utility key operation as long as any indication is displayed in the upper line of the VFD screen.
To enter the Utility setting, delete the on-screen indication by pressing the Memory key.
When "SAVE" is selected for the "Memory erasure or storage setting" item in the UTILITY setting on page 60-C21, the changed input volume is saved by pressing the Memory key.
Again, do not forget to press the Memory key in this step.

9.1.4. Changing the output volume

Step 1. Press the Output channel selection key to turn on the Output channel selection indicator (red dot) for the output channel for which you want to change volume.
Channels to be selected will change each time the Output channel selection key is pressed.
The channel name and volume level are displayed on the VFD screen.

Step 2. Adjust the volume using the output volume control.

Tip
Whether the changed volume is saved or not depends on the setting item "Memory erasure or storage" in the UTILITY setting on page 60-C21.

Step 3. After completing adjustments, press the Memory key.
The channel selection indicator extinguishes and the on-screen indication disappears.

Note
You cannot perform the Utility key operation as long as any indication is displayed in the upper line of the VFD screen.
To enter the Utility setting, delete the on-screen indication by pressing the Memory key.
When "SAVE" is selected for the "Memory erasure or storage setting" item in the UTILITY setting on page 60-C21, the changed input volume is saved by pressing the Memory key.
Again, do not forget to press the Memory key in this step.

9.1.5. Input channel ON/OFF

Input channels alternate between ON and OFF with each depression of the Input channel ON/OFF key.
The channel is ON when the input channel ON/OFF indicator (channel number) lights.
In the normal matrix operation, when an input channel is OFF, the Event including the input channel such as BGM or priority broadcast will not be activated, or cancelled if the Event is in progress.

9.1.6. Output channel ON/OFF

Output channels alternate between ON and OFF with each depression of the Output channel ON/OFF key.
The channel is ON when the Output channel ON/OFF indicator (channel number) lights.
In the normal matrix operation, when an output channel is OFF, no output goes through on the channel and the Event will not be cancelled.

9.2. Zone Paging

This section describes the method of initiating zone paging from a PABX (extension telephone) using the ZP-001T Zone Paging module. Note that the operation method differs depending on the ZP-001T's operation mode setting: paging port mode or ring signal mode.

In both operation modes, when any of the following situations arises, the ZP-001T will not receive calls from the PABX or the line will be cut off if the ZP-001T is being engaged in paging call.

- The input channel for the ZP-001T is turned off.
- The input channel for the ZP-001T is muted by way of the control input.
- Emergency-mute (EMG-MUTE) is activated by way of the control input.

9.2.1. Paging port mode

Step 1. Activate the paging port from the extension telephone.
Since this method differs depending on the type of exchange, please read the instruction manual for the extension telephone.
When the paging port is activated and the control input terminal is closed, the ZP-001T module connects the line.

Step 2. Select the output channel.
Press [0] first, followed by the output channel number* ([1] – [8] or [9] when selecting all numbers simultaneously). Pressing the [#] key completes the output channel selection.

* In the 1-channel or 2-channel output operation method, press the ZP-001T's control output number ([1] – [4] or [9] when selecting all numbers simultaneously).

Example: To select Outputs 2 and 3, press [0] [2] [3] [#].
To make an all-zone call, press [0] [9] [#].

Step 3. Begin paging.
When the pre-paging tone is set to ON (p. 44-A5), begin paging after the tone sounds.
When the selected output channel is being used by other broadcast with higher priority level, a busy tone is heard from the handset, indicating that paging cannot be performed.

Step 4. Deactivate the paging port to terminate paging.
Since this method differs depending on the type of exchange, please read the instruction manual for the extension telephone.

9.2.2. Ring signal mode

Step 1. Make a call from the extension telephone to the ZP-001T module.
After a calling tone sounds twice, the ZP-001T receives the call and a callback tone is heard from the handset.

Step 2. Select the output channel.
Press [0] first, followed by the output channel number* ([1] – [8] or [9] when selecting all numbers simultaneously). Pressing the [#] key completes the output channel selection.

* In the 1-channel or 2-channel output operation method, press the ZP-001T's control output number ([1] – [4] or [9] when selecting all numbers simultaneously).

Example: To select Outputs 2 and 3, press [0] [2] [3] [#].
To make an all-zone call, press [0] [9] [#].

Step 3. Begin paging.
When the pre-paging tone is set to ON (p. 44-A5), begin paging after the tone sounds.
Paging can be performed within 30 seconds after the call gets through. After 30 seconds have elapsed, the line is automatically disconnected.
When the selected output channel is being used by other broadcast with higher priority level, a busy tone is heard from the handset, indicating that paging cannot be performed.

Step 4. To terminate paging, press [0] [0] [#], and then replace the handset.

If dialing [0] [0] [#]: Pressing a first [0] terminates paging (a DTMF tone for the first [0] is output), and the ZP-001T disconnects the line after the [#] has been pressed.

If replacing the handset without dial operation: After a signal tone is transmitted about 3 times, the paging is terminated and the line disconnected.

9.3. Releasing Key Lock

The key lock function prevents the front-mounted keys or knobs from being tampered. (Refer to p. 78 "Key Lock Function Setting.")
You can temporarily operate the locked keys by entering a password to unlock them. Operation after password entry differs depending on the locked keys.

Step 1. Press the locked key.
The password entry screen is displayed with the flashing indication of the character entry position on the extreme left.

Note
If the front-mounted key operation is locked, the password entry screen appears after you press the input or output selection key and attempt to rotate the input or output volume control.

Step 2. Press the Enter key if no password has been set.
If the password has been set, enter it using the Input channel selection keys.

Entering a character causes the next character entry position to flash for character entry.
When the entered password is correct, the locked key is released. If the registered password is comprised of 1 to 3 characters, as soon as entered 1 to 3 characters agree with them, the locked key is released.

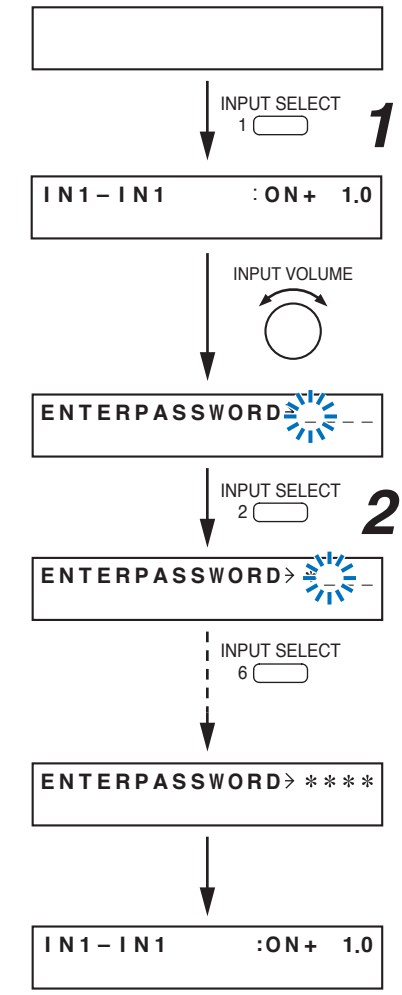
When released keys are those of the type related to input and output operations, they become temporarily operable, but revert to the locked state if they are left unused for 1 minute.

When utility-related keys are released, the key lock menu screen is displayed, clearing the password setting automatically.
Move to the screen for which you want to make a change.
When wishing to lock the keys using the password even after the setting has been changed, set the password again. (Refer to p. 82 "Password setting".)
To simultaneously release all locked keys, set the all-key lock function to OFF on the all-key lock ON/OFF setting screen.

When the power switch is locked, the password entry screen is not displayed if the power switch is pressed, and so the power cannot be turned off.

Since the key lock function helps to prevent the front panel keys or knobs from being tampered, their operation can be performed by controls through the control input terminals even if the keys or knobs are locked.

(Example when input keys are locked)



10. PAGING WHILE POWER IS OFF

The 9000 Series amplifiers are designed to initiate paging by way of the ZP-001T module or activate the Event*1 even while the power is OFF*2.

The unit operates as follows when the power is switched OFF:

- Events*1 by control input (including the C-001T module) can be activated, but those using the VOX (Voice Operated Exchange) function cannot be activated.
- The unit returns to Power-OFF state after Event or paging completion.
- Broadcasts can be initiated from the ZP-001T regardless of whether the operation mode is set to Ring Signal or Paging Port.
- Broadcasts cannot be performed for 2 seconds during which the Event is activated and the power amplifier begins to operate.
- When the power is switched OFF while an Event*1 is being activated by way of the control input with the power ON, even if the Event*1 is still left activated, the above-mentioned Events*1 or paging calls from the ZP-001T will have a priority regardless of priority level.

Controls to be performed during power-OFF

The power switch located on the amplifier front panel is a soft-switch, and not a mechanical switch to be used to turn on or off the power supply's primary side. Therefore, the internal microcomputer is still operating even if the power switch is set to OFF.

The following controls can be performed when the power is OFF.

- Remote power control by control input
  Power can be switched on and off using the external contact.
- Event*1 activation by control input
  Turns on the unit's power and activates the assigned Event (Trigger-set Event having the input with Priority 1 – 7) using the external contact. The unit returns to power-OFF state after Event operation completion.
- Paging by the ZP-001T
  Turns on the unit's power. The unit returns to power-OFF state after paging completion.

*1 The Event activation applies in the normal matrix operation. Take it as "Input channel ON" in the 1-channel or 2-channel output operation.

*2 The state that the front panel-mounted power switch is set to OFF position, and the power is still supplied to the unit from the AC inlet.

11. SYSTEM DESIGN-TO-OPERATION FLOW

1. Design the system.

1.1. Determine the input and output equipment.
1.2. Set the input-to-output routing and priority.

2. Prepare equipment.

2.1. Mount modules. (Refer to p. 89.)
2.2. Check to confirm that the Mode switch is set to the matrix mode. (Refer to p. 26.)
2.3. Connect the power source to the unit using the power cord, then turn on the power switch.

3. Perform equipment settings.

3.1. Select the operation method. (Refer to p. 36.)
3.2. Set the input parameters. (Refer to p. 41.)
3.3. Set the audio output names. (Refer to p. 46.)
3.4. Set the Event. (Normal matrix operation only) (Refer to p. 47.)
3.5. Set the utility function. (Refer to p. 52.)
3.6. Perform preliminary settings for the adjustment function. (Refer to p. 66.)
3.7. Set the key lock function. (Refer to p. 78.)
3.8. Switch off the power. (Refer to p. 29.)

4. Install equipment.

4.1. Mount equipment in a rack. (Refer to p. 103.)
4.2. Perform connections. (Refer to p. 92.)

5. Adjust equipment.

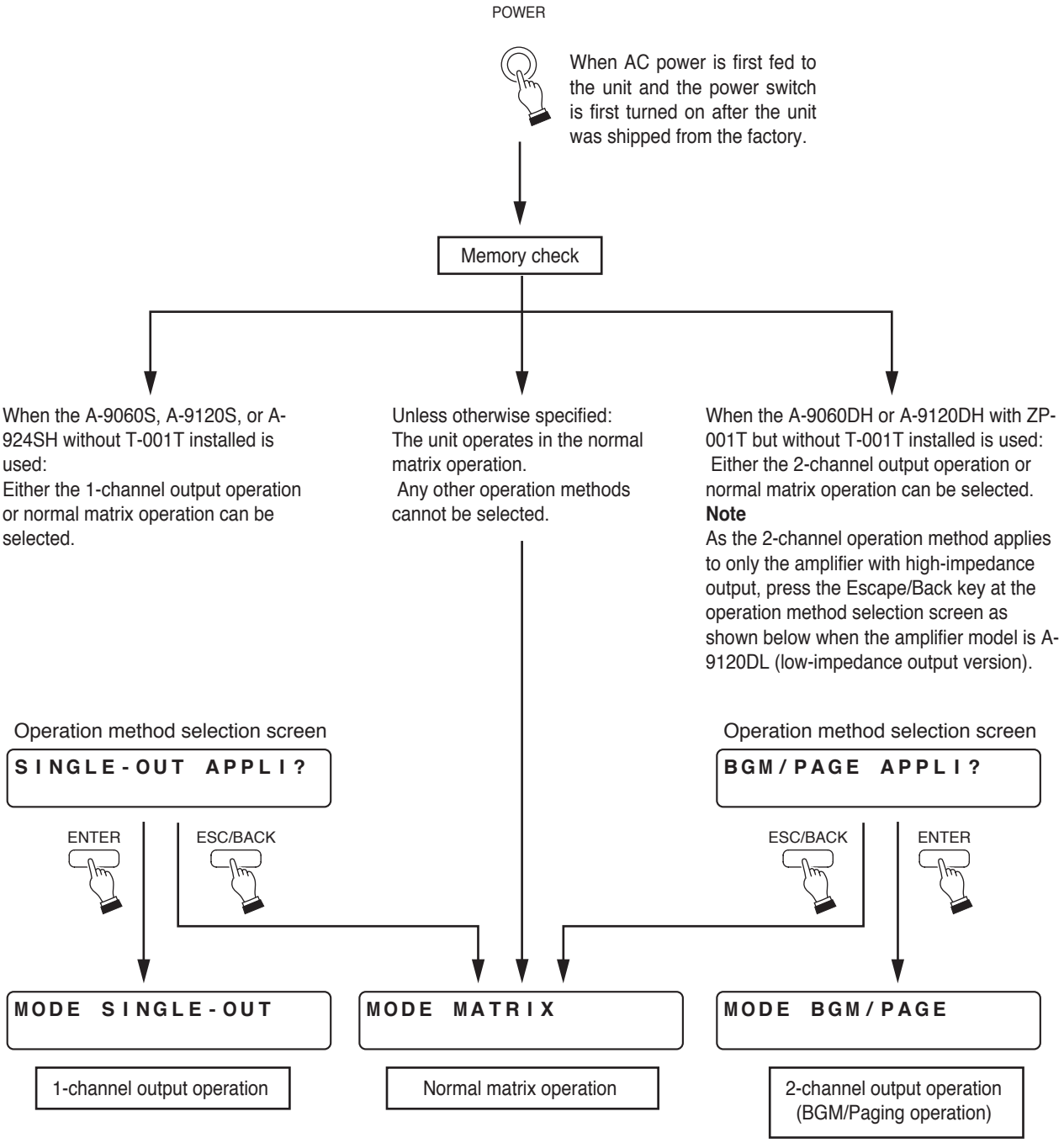
5.1. Switch on the power. (Refer to p. 29)
5.2. Make adjustments while monitoring the sound. (Refer to p. 66.)

6. Operate the system.

- Activate set broadcast patterns through remote control. (Refer to p. 118.)
- Perform operation using the front panel keys and knobs. (Refer to p. 29.)
- Make paging calls. (Refer to p. 31.)

12. SELECTING OPERATION METHOD

In the matrix mode, when the unit's power is first turned on after shipment from the factory, there is the case where the operation method can be or cannot be selected. This depends on the 9000 Series amplifier model and its module configuration. When the operation method selection is possible, proceed to the related settings after selection.


POWER
When AC power is first fed to the unit and the power switch is first turned on after the unit was shipped from the factory.
Memory check
When the A-9060S, A-9120S, or A-924SH without T-001T installed is used:
Either the 1-channel output operation or normal matrix operation can be selected.
Unless otherwise specified:
The unit operates in the normal matrix operation.
Any other operation methods cannot be selected.
When the A-9060DH or A-9120DH with ZP-001T but without T-001T installed is used:
Either the 2-channel output operation or normal matrix operation can be selected.
Note
As the 2-channel operation method applies to only the amplifier with high-impedance output, press the Escape/Back key at the operation method selection screen as shown below when the amplifier model is A-9120DL (low-impedance output version).
Operation method selection screen
SINGLE-OUT APPLI?
ENTER
ESC/BACK
Operation method selection screen
BGM/PAGE APPLI?
ESC/BACK
ENTER
MODE SINGLE-OUT
MODE MATRIX
MODE BGM/PAGE
1-channel output operation
Normal matrix operation
2-channel output operation (BGM/Paging operation)

Note

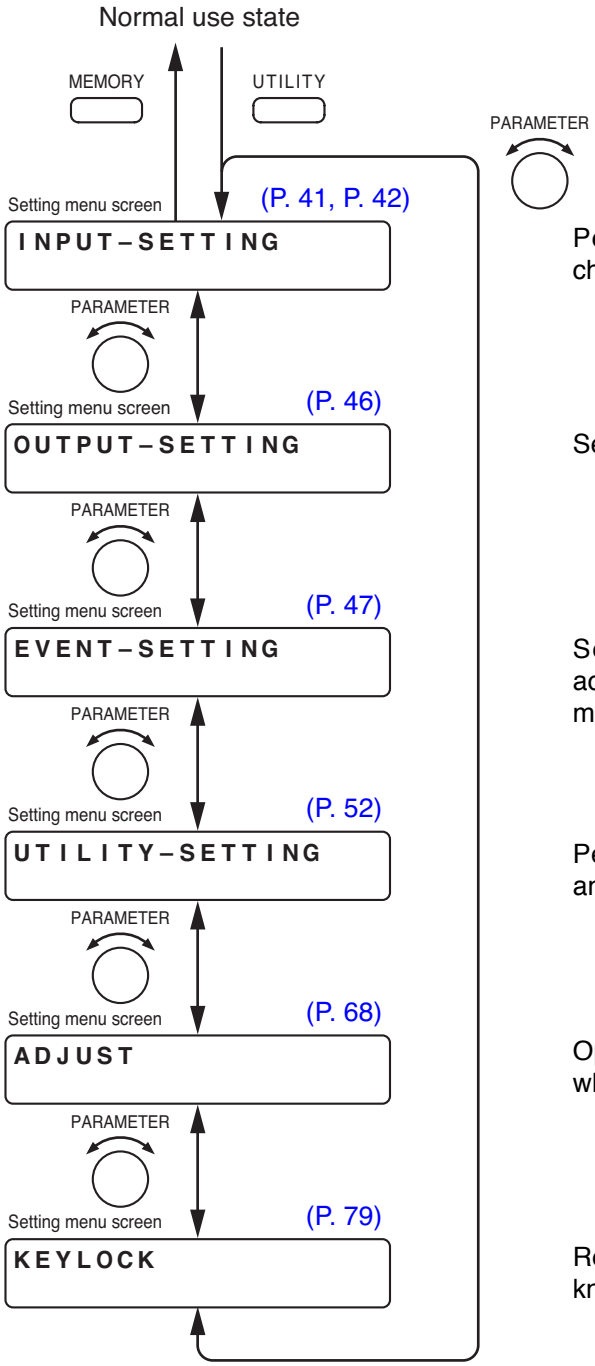
Once the operation method is set, its selection screen does not appear until the settings are initialized.
To change the operation method, change the relevant setting in the Utility setting flow. (Refer to p. 55.)
When you have uploaded the operation mode setting data to the unit using the supplied 9000 Series Programming Software, enter the setting mode by holding down the Utility key for 2 seconds or more, then press the Memory key to exit there, and the set operation mode is confirmed.

13. SETTING

Ensure that the Mode switch on the unit's rear panel is set to the MATRIX position before performing the setting. The setting items include those which must be set before operation (audio input/output, Event, and utility settings), those which are adjusted while actually monitoring the sound (adjustment mode settings), and those which restrict operations of front panel keys and knobs (key lock settings).
Select each item on the setting menu screen that appears after entering the setting mode, then proceed to the detailed settings. Broadcast, if present, is not interrupted when you enter the setting menu screen, but is interrupted when you proceed further to the subsequent setting screen except for the Adjustment mode.
If the AC power supply is cut off during setting, the parameters that have been set so far are all canceled. When the power returns, the unit is powered up in the normal use state just before entering the setting mode.

Tip
You can make setting data easily on the PC by using the Programming Software or the Excel file prepared as a utility tool for data setup; both are contained in the supplied CD-ROM.
For data setup on the Programming Software and the Excel sheets, refer to the instruction manuals of "PROGRAMMING SOFTWARE" and "EASY DATA SETUP USING EXCEL SHEETS" also contained in the CD-ROM.

13.1. Setting Menu Flow



Perform settings related to individual input and output channel names or input sources.

Set the name of each output channel.

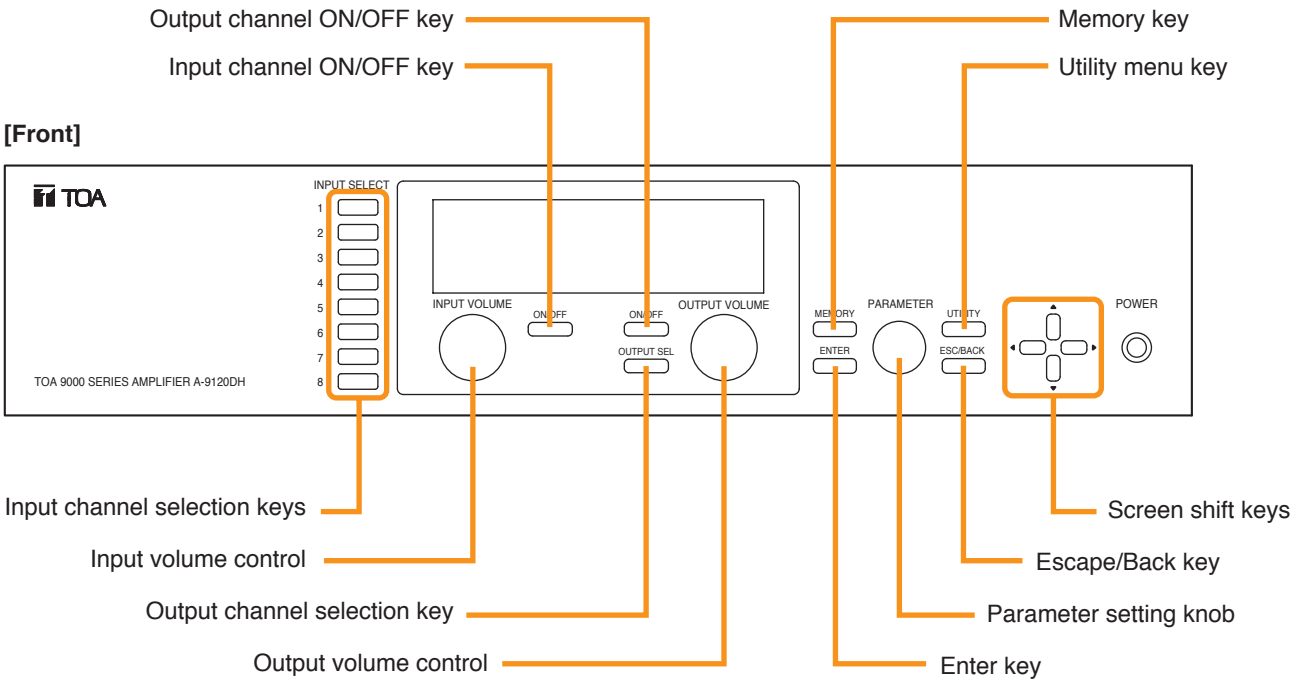
Set broadcast patterns, BGM broadcast groups and activation, and BGM broadcast termination. (Only in normal matrix operation)

Perform settings related to remote control, priority (FIFO and LIFO) settings and other utility settings.

Operate the unit actually and adjust the sound in real time while monitoring the sound.

Restrict the use of the unit's front panel-mounted keys and knobs.

13.2. Setting Keys and Knobs



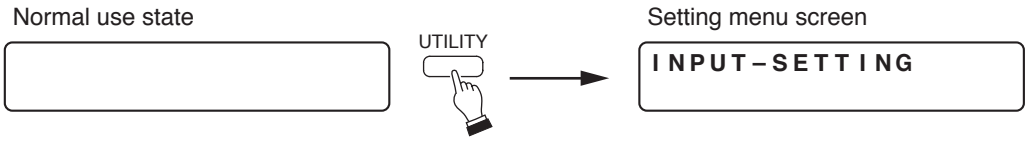
This figure represents the A-9120DH.

13.3. Basic Setting Operation

13.3.1. Entering the setting mode

Holding down the Utility menu key for 2 seconds or more displays the setting menu screen.

Note
You cannot enter the setting mode as long as any indication is displayed in the upper line of the VFD screen. To enter, delete the indication by pressing the Memory key, then hold down the Utility key for 2 seconds or more.



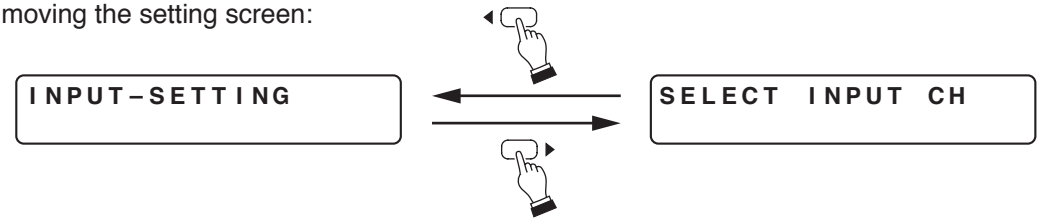
13.3.2. Setting screen operation examples

[Moving the setting screen or setting item]

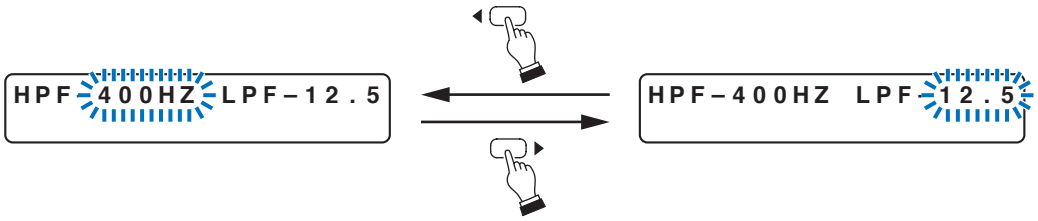
Use the Screen shift key mainly. (The Enter and Escape/Back keys may also be used.)

• Examples of using the Left and Right shift keys

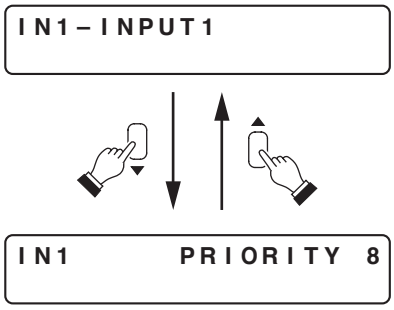
When moving the setting screen:



When moving the setting item on the same screen:

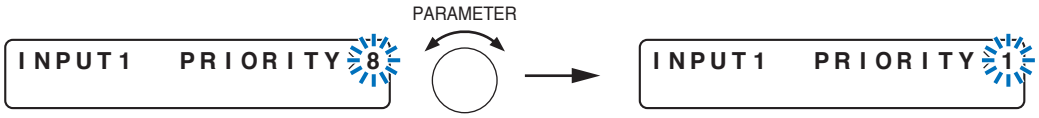


• Example of using the Up and Down shift keys

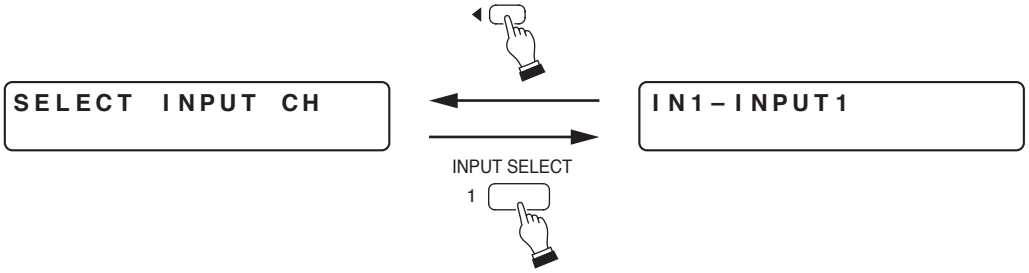


[Setting content selection]

Use the Parameter setting knob in most cases.
In some cases, however, use the input and output channel selection keys, or the input and output channel ON/OFF keys.

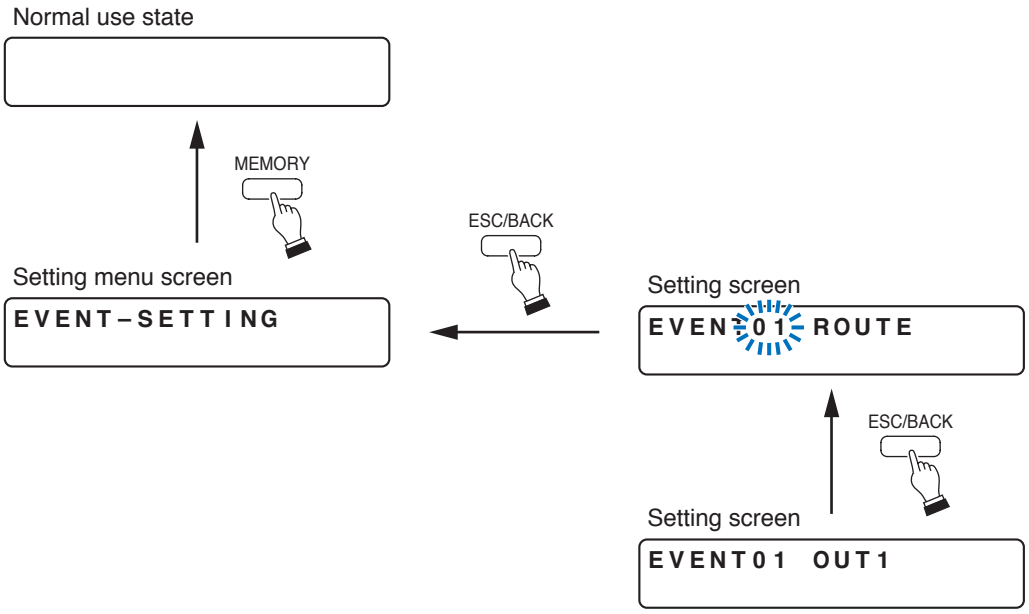


For example, to select an input channel, use the input channel selection key as shown below.



13.3.3. Returning from setting mode to normal use state

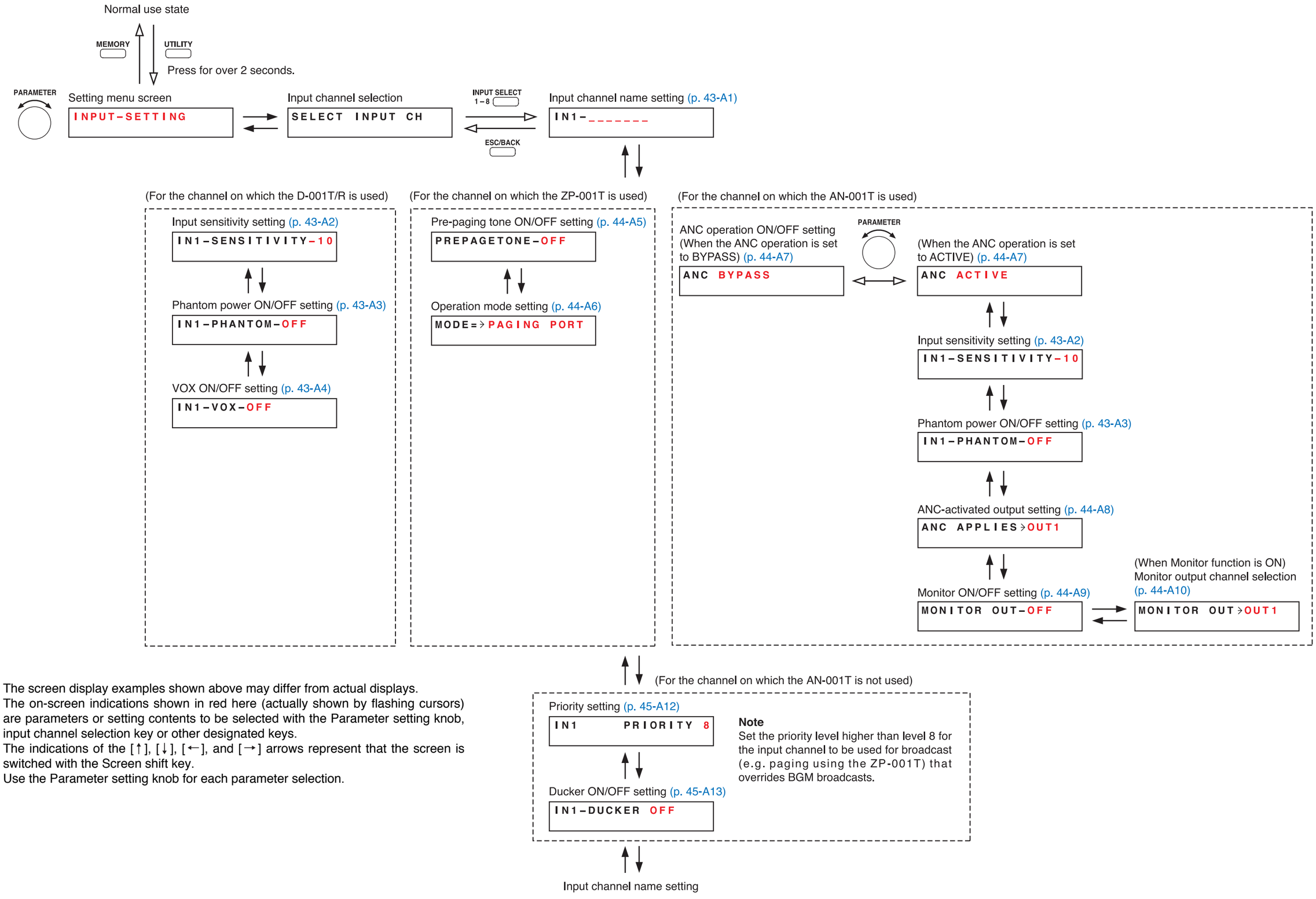
- Pressing the Escape/Back key when the setting screen is displayed returns the display to the setting start screen on the upper hierarchy level.
- Pressing the Memory key at the setting menu screen saves the setting contents and returns the display to the normal use state.



13.4. Input Parameter Setting

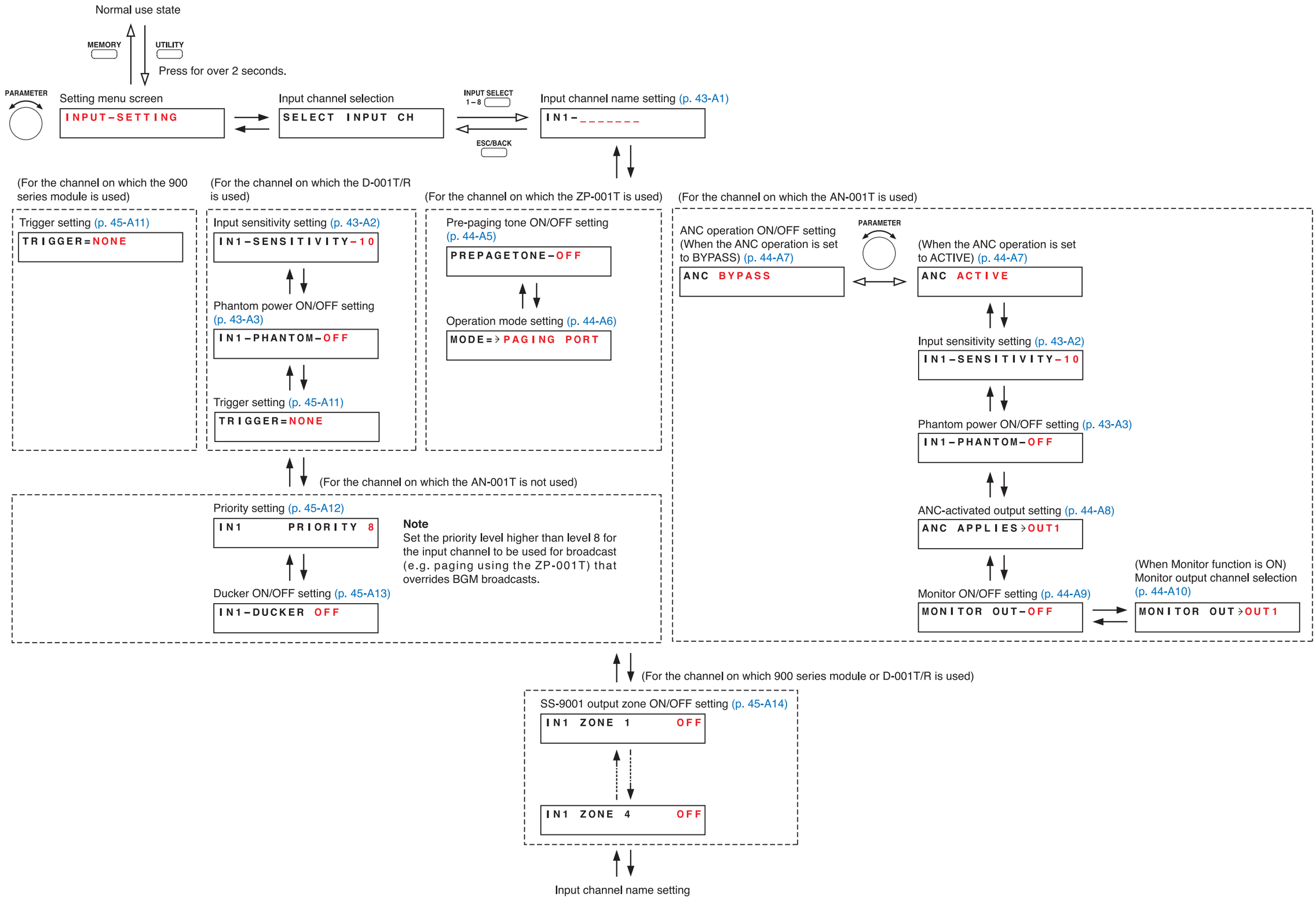
13.4.1. Setting flow chart

[Normal matrix operation]


Normal use state
MEMORY
UTILITY
Press for over 2 seconds.
PARAMETER
Setting menu screen
INPUT–SETTING
Input channel selection
SELECT INPUT CH
INPUT SELECT 1 – 8
ESC/BACK
Input channel name setting (p. 43-A1)
IN1–_ _ _ _ _ _ _
(For the channel on which the D-001T/R is used)
Input sensitivity setting (p. 43-A2)
IN1–SENSITIVITY–10
Phantom power ON/OFF setting (p. 43-A3)
IN1–PHANTOM–OFF
VOX ON/OFF setting (p. 43-A4)
IN1–VOX–OFF
(For the channel on which the ZP-001T is used)
Pre-paging tone ON/OFF setting (p. 44-A5)
PREPAGETONE–OFF
Operation mode setting (p. 44-A6)
MODE=>PAGING PORT
(For the channel on which the AN-001T is used)
ANC operation ON/OFF setting (When the ANC operation is set to BYPASS) (p. 44-A7)
ANC BYPASS
PARAMETER
(When the ANC operation is set to ACTIVE) (p. 44-A7)
ANC ACTIVE
Input sensitivity setting (p. 43-A2)
IN1–SENSITIVITY–10
Phantom power ON/OFF setting (p. 43-A3)
IN1–PHANTOM–OFF
ANC-activated output setting (p. 44-A8)
ANC APPLIES>OUT1
Monitor ON/OFF setting (p. 44-A9)
MONITOR OUT–OFF
(When Monitor function is ON) Monitor output channel selection (p. 44-A10)
MONITOR OUT>OUT1
(For the channel on which the AN-001T is not used)
Priority setting (p. 45-A12)
IN1 PRIORITY 8
Ducker ON/OFF setting (p. 45-A13)
IN1–DUCKER OFF
Note
Set the priority level higher than level 8 for the input channel to be used for broadcast (e.g. paging using the ZP-001T) that overrides BGM broadcasts.
Input channel name setting

The screen display examples shown above may differ from actual displays.
The on-screen indications shown in red here (actually shown by flashing cursors) are parameters or setting contents to be selected with the Parameter setting knob, input channel selection key or other designated keys.
The indications of the [↑], [↓], [←], and [→] arrows represent that the screen is switched with the Screen shift key.
Use the Parameter setting knob for each parameter selection.

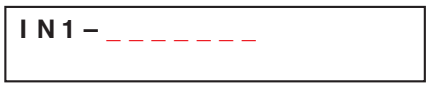
[1-channel or 2-channel output operation]


Normal use state
MEMORY
UTILITY
Press for over 2 seconds.
PARAMETER
Setting menu screen
INPUT-SETTING
Input channel selection
SELECT INPUT CH
INPUT SELECT 1 – 8
ESC/BACK
Input channel name setting (p. 43-A1)
IN1-_ _ _ _ _ _ _
(For the channel on which the 900 series module is used)
Trigger setting (p. 45-A11)
TRIGGER=NONE
(For the channel on which the D-001T/R is used)
Input sensitivity setting (p. 43-A2)
IN1-SENSITIVITY-10
Phantom power ON/OFF setting (p. 43-A3)
IN1-PHANTOM-OFF
Trigger setting (p. 45-A11)
TRIGGER=NONE
(For the channel on which the ZP-001T is used)
Pre-paging tone ON/OFF setting (p. 44-A5)
PREPAGETONE-OFF
Operation mode setting (p. 44-A6)
MODE=>PAGING PORT
(For the channel on which the AN-001T is used)
ANC operation ON/OFF setting (When the ANC operation is set to BYPASS) (p. 44-A7)
ANC BYPASS
PARAMETER
(When the ANC operation is set to ACTIVE) (p. 44-A7)
ANC ACTIVE
Input sensitivity setting (p. 43-A2)
IN1-SENSITIVITY-10
Phantom power ON/OFF setting (p. 43-A3)
IN1-PHANTOM-OFF
ANC-activated output setting (p. 44-A8)
ANC APPLIES>OUT1
Monitor ON/OFF setting (p. 44-A9)
MONITOR OUT-OFF
(When Monitor function is ON) Monitor output channel selection (p. 44-A10)
MONITOR OUT>OUT1
(For the channel on which the AN-001T is not used)
Priority setting (p. 45-A12)
IN1 PRIORITY 8
Ducker ON/OFF setting (p. 45-A13)
IN1-DUCKER OFF
Note
Set the priority level higher than level 8 for the input channel to be used for broadcast (e.g. paging using the ZP-001T) that overrides BGM broadcasts.
(For the channel on which 900 series module or D-001T/R is used)
SS-9001 output zone ON/OFF setting (p. 45-A14)
IN1 ZONE 1 OFF
IN1 ZONE 4 OFF
Input channel name setting

13.4.2. Input setting items

Use the Parameter setting knob for each parameter selection.

(A1) Input channel name setting



The flashing portion is the cursor position for entering channel name characters.
Select a character from the alphanumeric character list by rotating the Parameter setting knob, then move the cursor with the Right shift key.
Entering a new name overwrites the existing name, if there is.
To delete the character, select [_] (under-bar) with the Parameter setting knob. Space cannot be entered.
Up to 7 characters can be used to set the name.
Even when an input channel name has been set, some setting screens display the channel number, not the set name.

Setting Range	7 characters (default: IN1 – 8)

(A2) Input sensitivity setting
(when the D-001T/R is used or when the AN-001T is used and ANC operation is set to ACTIVE)

Select the input sensitivity from the following 9 levels depending on the input sources:

Setting Range	–60, –54, –48, –42, –36, –30, –24, –18, –10 dB (default)

Note
Setting the input sensitivity for the AN-001T's input channel automatically determines the reference level which is a starting point for detecting the change in ambient noise level. The reference level can be fine adjusted in Adjustment mode. (p. 68, p. 73-D14)

(A3) Phantom power ON/OFF setting
(when the D-001T/R is used or when the AN-001T is used and ANC operation is set to ACTIVE)

Set the Phantom power to ON or OFF.

Note: When the module is the D-001R, this function can be set to ON but cannot be output.

Setting Range	ON, OFF (default)

- ON: Supplies the phantom power. (except D-001R)
- OFF: Does not supply the phantom power.

(A4) VOX ON/OFF setting (only in the normal matrix operation, when the D-001T/R is used)

Set the voice operated exchange (VOX) to ON or OFF.

Setting Range	ON, OFF (default)

- ON: Activates the set Event only when the audio signals are input to the module.
- OFF: The VOX function does not work.

(A5) Pre-paging tone ON/OFF setting (when the ZP-001T is used)

Set whether or not to sound a one-tone chime before paging.

Setting Range	ON, OFF (default)

When set to OFF, the tone does not sound at the paging telephone, either.

(A6) Operation mode setting (when the ZP-001T is used)

Select the method of activating paging.

Setting Range	PAGING PORT (default), RING SIGNAL

- PAGING PORT: Paging is operated if a start signal (no-voltage make signal) is received from the paging port when the connection between the unit and PABX is established.
- RING SIGNAL: Paging is operated if an IR signal is received when the connection between the unit and PABX is established. The ZP-001T module functions as a telephone.

(A7) ANC operation ON/OFF setting (when the AN-001T is used and ANC operation is set to ACTIVE)

Set the ANC operation (p. 28 "Glossary") on or off.

Setting Range	ACTIVE, BYPASS (default)

- ACTIVE: Activates the ANC function.
- BYPASS: ANC function does not work.

(A8) ANC-activated output setting (when the AN-001T is used and ANC operation is set to ACTIVE)

Set on which output channel the ANC function works.

Setting Range	OUT1 – 2, Max. 8 when T-001Ts are used (default: OUT1)

(A9) Monitor ON/OFF setting (when the AN-001T is used and ANC operation is set to ACTIVE)

Set to ON or OFF the monitor function that permits the ambient noise input signal to be output.

Setting Range	ON, OFF (default)

- ON: Outputs signals to be monitored.
- OFF: Does not output signals to be monitored.

(A10) Monitor output channel selection
(when the AN-001T is used, the ANC operation is ACTIVE, and the Monitor function is ON)

Select the output channel on which signals to be monitored are output.

Setting Range	OUT1 – 2, Max. 8 when T-001Ts are used (default: OUT1)

(A11) Trigger setting
(only in the 1-channel or 2-channel output operation, when the 900 series module or D-001T/R is used)

TRIGGER=NONE

Set how to activate the selected input channel.

Setting Range	NONE (default), C-IN01 – 04 (C-IN01 – 12 when C-001T is used), VOX (Selectable only when D-001T/R is used)

(A12) Priority setting (when the AN-001T is not used)

IN1 PRIORITY 8

Assign priority levels of 1 – 8 (high to low) to the selected input signals.
In the normal matrix operation, the priority level given to each Event is based on the priority level set here.
In the 2-channel output operation, the signals of input channel set for Priority 8 are output at Output channel 1 and the signals of input channel set for Priority 1 - 7 at Output channel 2.

Setting Range	1 – 8 (default: 8, 7 only when ZP-001T is used)

The signal set to priority level 8 is handled as BGM in Event settings.
It is possible to assign the same priority level to multiple inputs.
When two or more inputs are simultaneously broadcast in the same zone, the input with higher priority takes precedence. However, when multiple inputs with the same priority are simultaneously broadcast, they are allowed to go through according to the priority settings (refer to p. 61-C25 "Priority setting").
Set the priority level higher than level 8 for the input channel to be used for broadcast (e.g. paging using the ZP-001T) that overrides BGM broadcasts.
Unlike other Events* with priorities 1 – 7, the BGM Event with priority 8, once activated, is not terminated until the BGM End is activated.

* These Events are terminated in any of the following cases:
  - If an Event is activated at the control input terminal or by the VOX function, this Event is terminated when the activation trigger is turned off.
  - If an Event is activated by the ZM-9001 or ZM-9002, this Event is terminated when the control input terminal set for "BUSY-IN" is turned off.
  - When Events with higher priority level override all output channels of the Event in progress, this forcibly terminates the original Event.

(A13) Ducker ON/OFF setting (when the AN-001T is not used)

IN1–DUCKER OFF

Set the ducker function to ON or OFF.
When multiple input signals are simultaneously broadcast, the ducker function automatically attenuates input signals of other channels with lower priority.

Setting Range	ON, OFF (default)

The ducker function does not work among the input channels with the same priority level.
The function does not work either unless the relevant input channels are all set for the ducker function, permitting all the input signals to be mixed and output.

(A14) SS-9001 output zone ON/OFF setting (when the 900 series module or D-001T/R is used)

IN1 ZONE 1 OFF

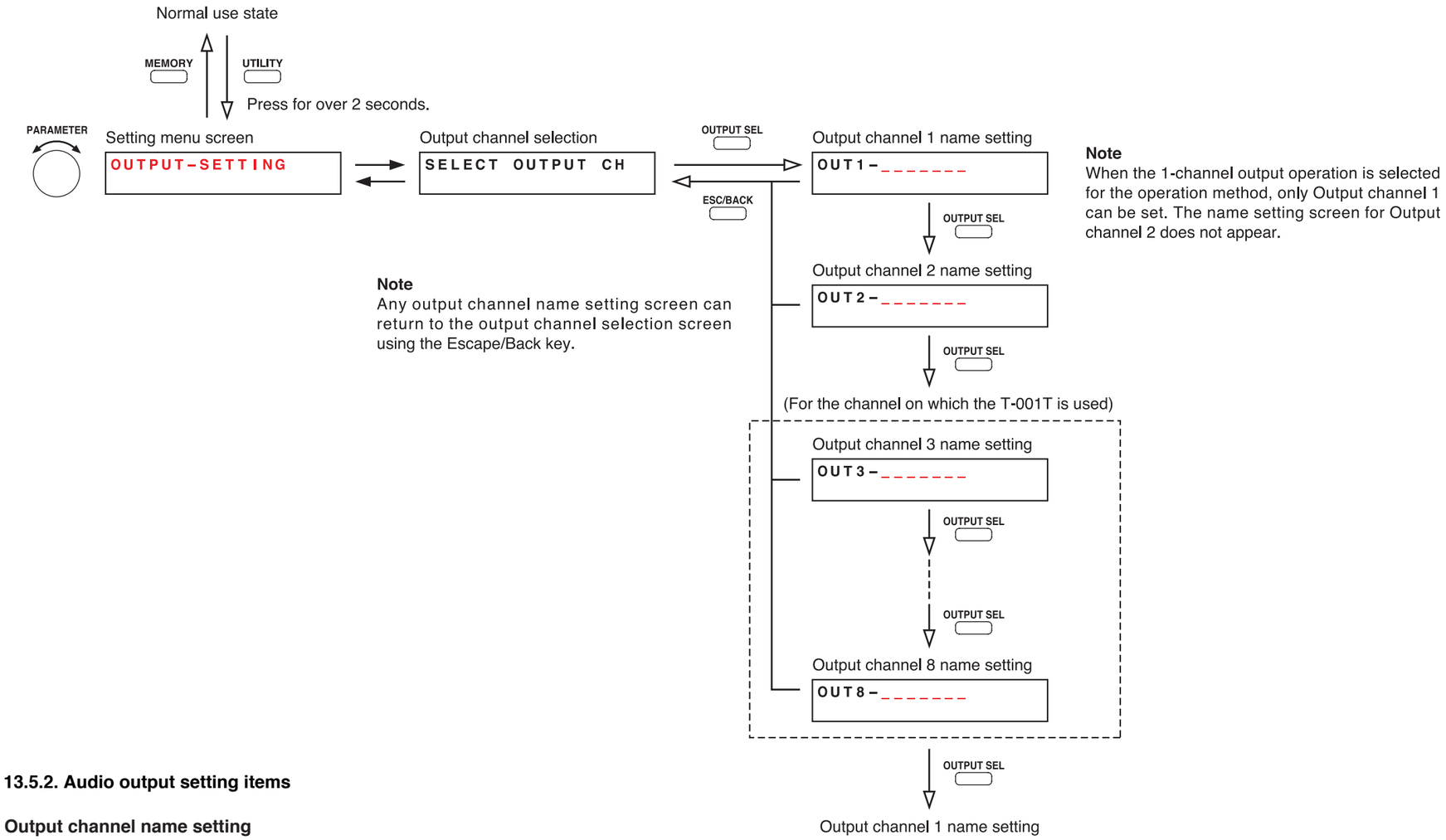
Set each of the output zones 1 – 4 to ON or OFF when the SS-9001 is connected to the amplifier.

Setting Range	ON, OFF (default)

13.5. Audio Output Name Setting

13.5.1. Setting flow chart

The screen display examples shown below may differ from actual displays.
The on-screen indications shown in red here (actually shown by flashing cursors) are parameters or setting contents to be selected with the Parameter setting knob, input channel selection key or other designated keys.
The indications of the [↑], [↓], [←], and [→] arrows represent that the screen is switched with the Screen shift key.
Use the Parameter setting knob for each parameter selection.



Note
When the 1-channel output operation is selected for the operation method, only Output channel 1 can be set. The name setting screen for Output channel 2 does not appear.

Note
Any output channel name setting screen can return to the output channel selection screen using the Escape/Back key.

13.5.2. Audio output setting items

Output channel name setting

```
OUT1-_______
```

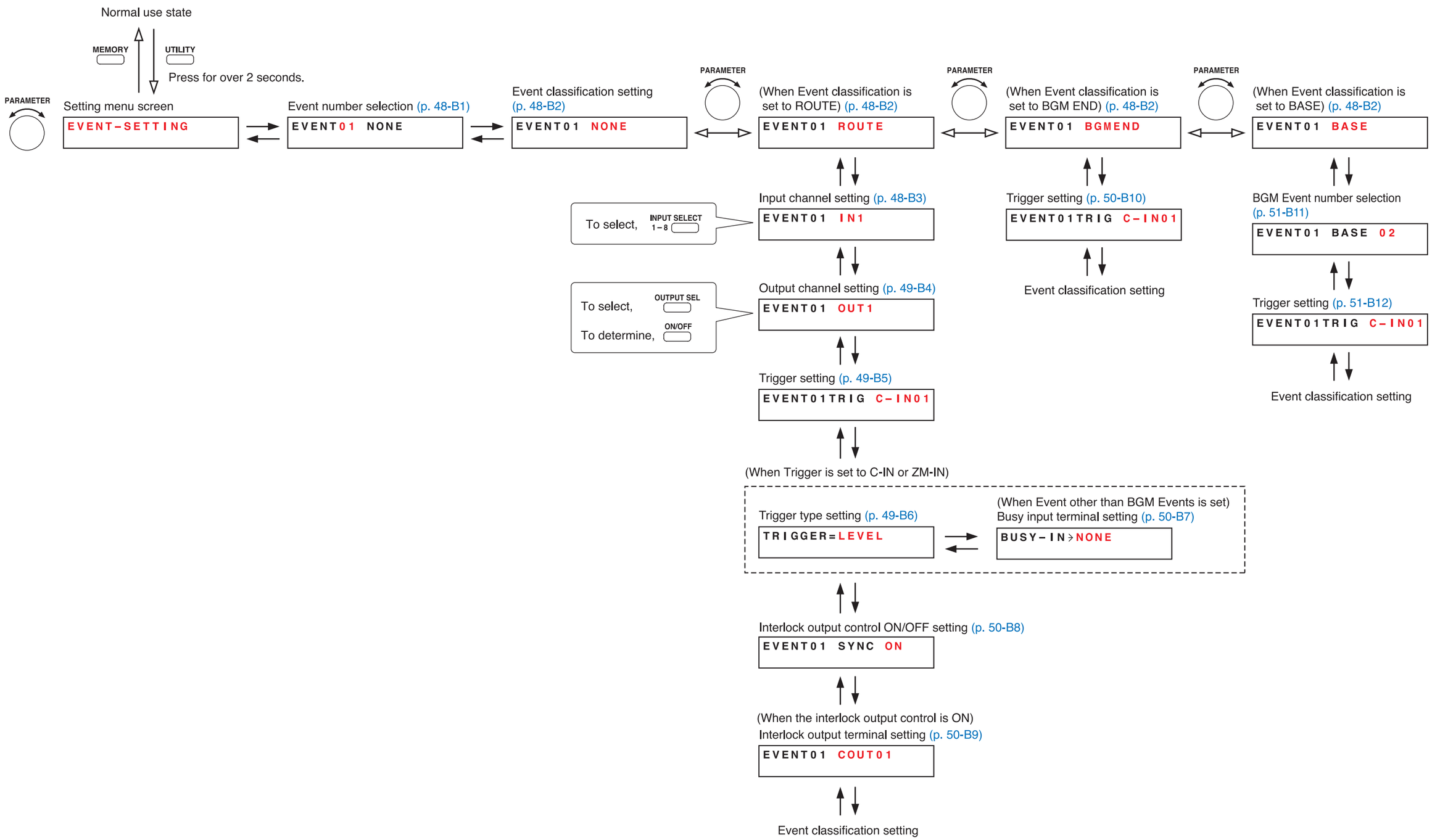
The flashing portion is the cursor position for entering channel name characters.
Select a character from the alphanumeric character list by rotating the Parameter setting knob, then move the cursor with the Right shift key.
Entering a new name overwrites the existing name, if there is.
To delete the character, select [_] (under-bar) with the Parameter setting knob. Space cannot be entered.
Up to 7 characters can be used to set the name.
Even when an output channel name has been set, some setting screens display the channel number, not the set name.

Setting Range	7 characters (default setting: OUT1 – 8)

13.6. Event Setting (Only in the normal matrix operation)

13.6.1. Setting flow chart

The screen display examples shown below may differ from actual displays.
The on-screen indications shown in red here (actually shown by flashing cursors) are parameters or setting contents to be selected with the Parameter setting knob, input channel selection key or other designated keys.
The indications of the [↑], [↓], [←], and [→] arrows represent that the screen is switched with the Screen shift key.
Unless otherwise specified, use the Parameter setting knob for each parameter selection.



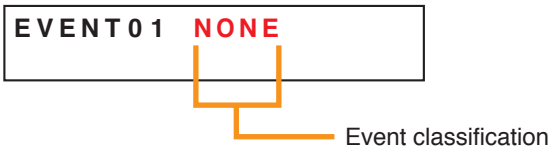
13.6.2. Event setting items

Unless otherwise specified, use the Parameter setting knob for each parameter selection.

(B1) Event number selection

Setting Range	01 – 32 (default: 01)

(B2) Event classification setting



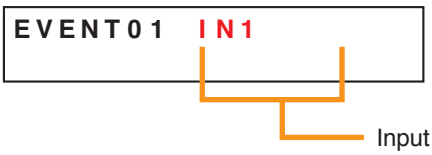
Setting Range	NONE (default), ROUTE, BGM END, BASE

- NONE: Invalidates the selected Event.
- ROUTE: Sets broadcast patterns consisting of input/output, trigger, and other settings.
- BGM END: Used to perform settings for terminating all Events to which inputs with priority 8 are assigned.
- BASE: Groups broadcast patters which have been set to "Priority 8 Input with Trigger set to NONE " in Classification ROUTE, so that they may be activated with a single trigger. This classification is normally used to set the Event of BGM broadcasts.

Notes

- Screens that appear when the Up or Down shift key is pressed differ depending on the Event classification settings.
- When the priority of input channel to be set in "ROUTE" is 8 (BGM Event), the BGM End setting and its activation are required to terminate the BGM Event.
  Events except the BGM Event are terminated in any of the following cases:
  - If an Event is activated at the control input terminal or by the VOX function, this Event is terminated when the activation trigger is turned off.
  - If an Event is activated by the ZM-9001 or ZM-9002, this Event is terminated when the control input terminal set for "BUSY-IN" is turned off.
  - When Events with higher priority level override all output channels of the Event in progress, this forcibly terminates the original Event.

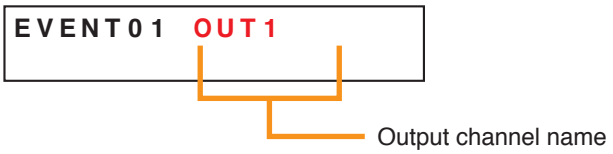
(B3) Input channel setting (when Event classification is set to ROUTE)



Set the input channel using the Input channel selection key.
The name of the set input channel is displayed on the screen.
One input channel can be set per Event.

Setting Range	IN1 – 8 (default: IN1)

(B4) Output channel setting (when Event classification is set to ROUTE)



Setting Range	OUT1 – 2, Max. 8 when T-001Ts are used (default: OUT1) **Note:** 2 or more channels selectable.

- Select the output channel using the Output channel selection key. The name of selected output channel is displayed on the screen. Then confirm the selection by setting the Output channel ON/OFF key to ON (the output channel indicator, red dot on the VFD screen lights).
- Repeat above operations to set multiple outputs.

(B5) Trigger setting (when Event classification is set to ROUTE)

Set how to activate the selected Event.

Setting Range	NONE (default), VOX, C-IN01 – 04 (C-IN01 – 12 when C-001T is used) ZM-IN01 – 12* * Selectable only when the Remote controller type (p. 62-C26) is set to ZM-9001 or ZM-9002, and the Trigger type (next item) to PULSE.

- NONE: External control cannot be used for activation. Set the trigger setting here to NONE when designating the selected Event number as a BGM pattern.
- VOX: The event is activated when the selected input channel receives a signal.
  Note
  The D-001T/R module must be used for input, and the VOX set to ON in the audio input setting.
- C-IN1 to C-IN04 (C-IN1 to C-IN12 when the C-001T module is used):
  Closing the designated control input terminal activates the Event.
  Assigning a function to this terminal overwrites the previously set function on it if there is.
  The type of trigger is fixed to "LEVEL."
- ZM-IN01 to ZM-IN12:
  The indications ZM-IN01 – 06 or 01 – 04 correspond to the control buttons of the ZM-9001 or ZM-9002 connected to the 9000 Series amplifier's remote volume control terminal 1 (REMT VOL 1).
  The indications of ZM-IN with subsequent numbers correspond to ZM-9001's or ZM-9002's control buttons connected to the remote volume control terminal 2 (REMT VOL 2).
  Pressing the designated control button activates the Event.
  Assigning a function to the button overwrites the previously set function on it if there is.
  The type of trigger is fixed to "PULSE."

(B6) Trigger type setting (when Event classification is set to ROUTE, and Trigger to C-IN or ZM-IN)

Set the type of trigger to either LEVEL or PULSE.
This setting is valid for the input channels with Priority levels 1 to 7.
Refer to p. 94 "Operation by control input" for each trigger operation.

Setting Range	LEVEL (default), PULSE **Note:** "LEVEL" is fixed when selecting "C-IN01" through "C-IN12" in the Trigger setting (previous item), and "PULSE" is fixed when selecting "ZM-IN01" through "ZM-IN12."

Note
When the trigger type is "PULSE" (the trigger is set for "ZM-IN"), be sure to make the Busy input terminal setting (B7).

(B7) Busy input terminal setting
(when Event classification is set to ROUTE, Trigger to C-IN or ZM-IN, and Event other than BGM Events is set)

Select the control input terminal to receive Busy signal.
Selecting the terminal overwrites the previously set function on it if there is.

Setting Range	NONE (default), C-IN01 – 04 (C-IN01 – 12 when C-001T is used)

Once broadcast is activated by means of a pulse trigger, a signal is needed to terminate the broadcast.
A busy signal is used for this purpose. It works in the way that the busy signal (make contact) is kept being fed to the control input terminal during broadcast but cut at the end of broadcast.
Thus, the end of broadcast is defined by using a busy signal.

(B8) Interlock output control ON/OFF setting (when Event classification is set to ROUTE)

Set whether or not to close the control output terminal in synchronization with the Event's activation.

Setting Range	ON, OFF (default)

- ON: Control output terminal is closed when the Event is activated. (The terminal is continuously closed during Event activation.)
- OFF: Control output does not interlock with the Event's activation.

(B9) Interlock output terminal setting (when Event classification is set to ROUTE)

Set the control output terminals 1 – 4 (1 – 12 when the C-001T is used) which are closed in synchronization with the Event's activation.
Assigning a function to these terminals overwrites the previously set functions on them if there are.

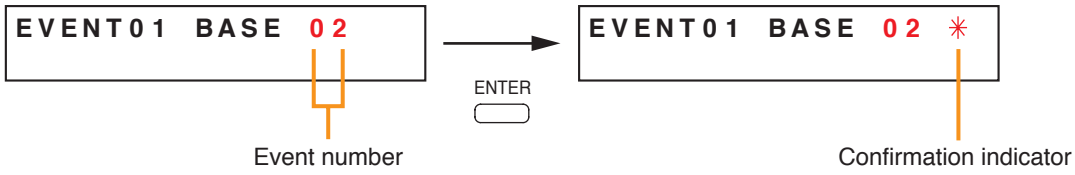
Setting Range	COUT01 – 04, C-OUT01 – 12 when C-001T is used (default: COUT01) **Note:** When the interlock output control ON/OFF setting is ON.

(B10) Trigger setting (when Event classification is set to BGM END)

Activating the selected Event terminates all Events for Priority-8 inputs.
Set the control input that activates the Event termination.
Assigning a function to the control input terminal or ZM-9001/9002's control button overwrites the previously set function on it if there is.

Setting Range	C-IN01 – 04 (C-IN01 – 12 when C-001T is used), ZM-IN01 – 12* (default: C-IN01) * Selectable only when the Remote controller type (p. 62-C26) is set to ZM-9001 or ZM-9002.

(B11) BGM Event number selection (when Event classification is set to BASE)



Setting Range	01 – 32 (default: 01)

Rotating the Parameter setting knob displays only the priority-8 inputs with the trigger function set to NONE (normally BGM broadcasts) out of the Event numbers with Event classification set to ROUTE.
When the Enter key is pressed for confirmation, an asterisk [✳] is displayed on the right of the confirmed number.
Up to 4 Event numbers can be set by repeating above-mentioned operations.
If the number of confirmed Event numbers exceeds 4, each number is erased in chronological order.

(B12) Trigger setting (when Event classification is set to BASE)

Set how to activate the selected Event.

Setting Range	NONE, C-IN01 – 04 (C-IN01 – 12 when C-001T is used), ZM-IN01 – 12* (default: C-IN01) * Selectable only when the Remote controller type (p. 62-C26) is set to ZM-9001 or ZM-9002.

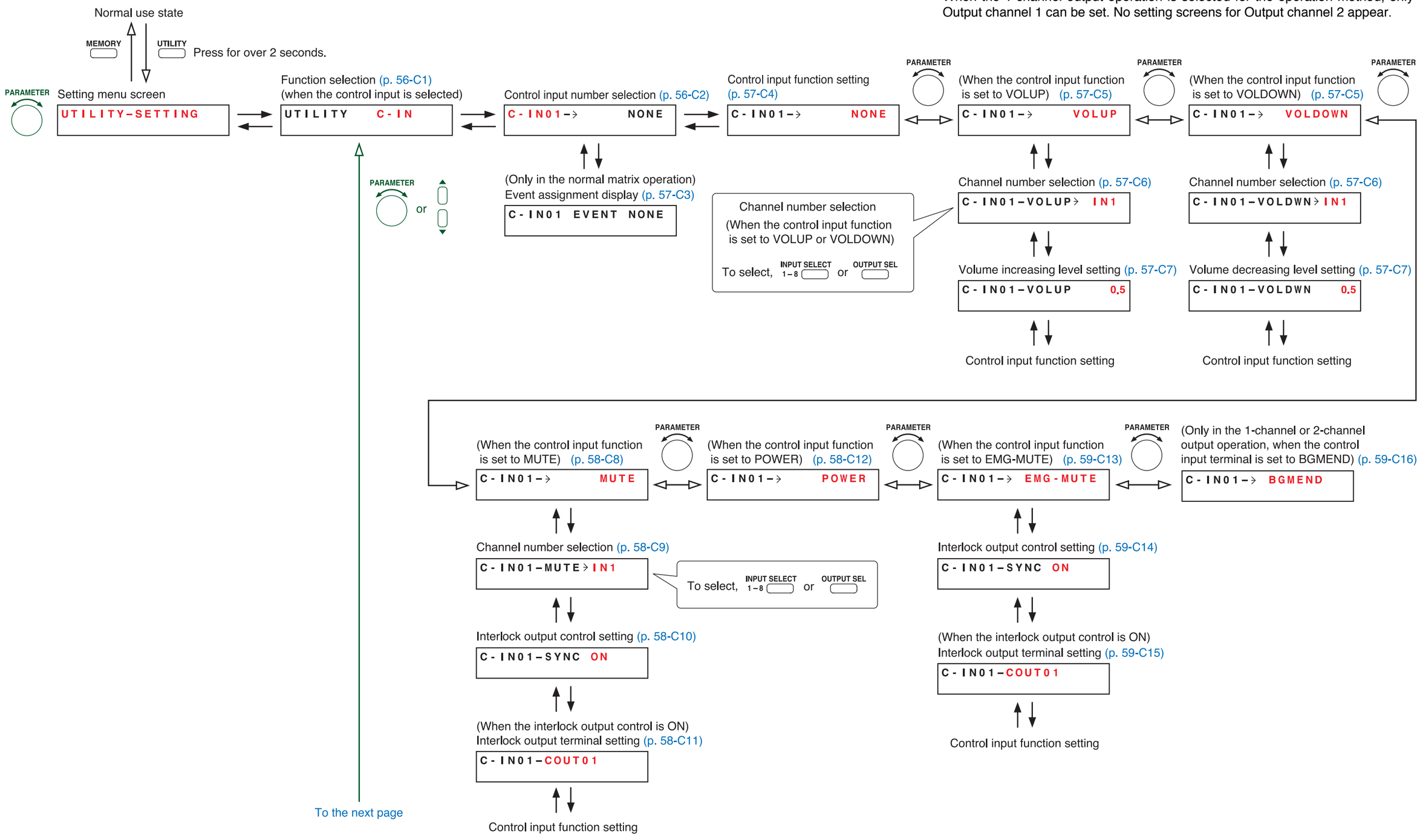
- C-IN01 to C-IN04 (C-IN01 to C-IN12 when the C-001T module is used):
  Closing the designated control input terminal activates the Event. The control input terminals that have already been set cannot be set.
- ZM-IN01 to ZM-IN12:
  Pressing the designated control button of the ZM-9001 or ZM-9002 activates the Event.
  Assigning a function to the button overwrites the previously set function on it if there is.
- NONE: External control cannot be used for activation.

13.7. Utility Setting

13.7.1. Setting flow chart

The screen display examples shown below may differ from actual displays.
The on-screen indications shown in red here (actually shown by flashing cursors) are parameters or setting contents to be selected with the Parameter setting knob, input channel selection key or other designated keys.
The indications of the [↑], [↓], [←], and [→] arrows represent that the screen is switched with the Screen shift key.
Unless otherwise specified, use the Parameter setting knob for each parameter selection.

Note
When the 1-channel output operation is selected for the operation method, only Output channel 1 can be set. No setting screens for Output channel 2 appear.


Normal use state
MEMORY
UTILITY
Press for over 2 seconds.
PARAMETER
Setting menu screen
UTILITY–SETTING
Function selection (p. 56-C1)
(when the control input is selected)
UTILITY C-IN
Control input number selection (p. 56-C2)
C-IN01–→ NONE
Control input function setting (p. 57-C4)
C-IN01–→ NONE
(When the control input function is set to VOLUP) (p. 57-C5)
C-IN01–→ VOLUP
(When the control input function is set to VOLDOWN) (p. 57-C5)
C-IN01–→ VOLDOWN
PARAMETER
or
(Only in the normal matrix operation)
Event assignment display (p. 57-C3)
C-IN01 EVENT NONE
Channel number selection
(When the control input function is set to VOLUP or VOLDOWN)
To select, INPUT SELECT 1–8 or OUTPUT SEL
Channel number selection (p. 57-C6)
C-IN01–VOLUP→ IN1
Channel number selection (p. 57-C6)
C-IN01–VOLDWN→ IN1
Volume increasing level setting (p. 57-C7)
C-IN01–VOLUP 0.5
Volume decreasing level setting (p. 57-C7)
C-IN01–VOLDWN 0.5
Control input function setting
Control input function setting
(When the control input function is set to MUTE) (p. 58-C8)
C-IN01–→ MUTE
(When the control input function is set to POWER) (p. 58-C12)
C-IN01–→ POWER
(When the control input function is set to EMG-MUTE) (p. 59-C13)
C-IN01–→ EMG-MUTE
(Only in the 1-channel or 2-channel output operation, when the control input terminal is set to BGMEND) (p. 59-C16)
C-IN01–→ BGMEND
Channel number selection (p. 58-C9)
C-IN01–MUTE→ IN1
To select, INPUT SELECT 1–8 or OUTPUT SEL
Interlock output control setting (p. 58-C10)
C-IN01–SYNC ON
Interlock output control setting (p. 59-C14)
C-IN01–SYNC ON
(When the interlock output control is ON)
Interlock output terminal setting (p. 58-C11)
C-IN01–COUT01
(When the interlock output control is ON)
Interlock output terminal setting (p. 59-C15)
C-IN01–COUT01
Control input function setting
Control input function setting

To the next page

From the previous page

(P. 56-C1)

Function selection
(when the control output is selected)

UTILILY C-OUT

PARAMETER or

Control output number selection
(p. 59-C17)

C-OUT01> NONE

Interlock output control display
(only in the normal matrix operation)
(p. 60-C18)

C-OUT01 EVENT NONE

Control output function selection
(p. 60-C19)

C-OUT01> NONE

PARAMETER

(When the control output function is set to POWER) (p. 60-C20)

C-OUT01> POWER

Function selection
(when the memory setting at power-off is selected)

UTILITY POWEROFF

PARAMETER or

Memory erasure or strage setting (p. 60-C21)

POWEROFF–>DEL

Function selection
(when the VOX release time is selected)

UTILITY VOX TIME

PARAMETER or

VOX release time setting (p. 60-C22)

VOX RELEASE TIME>5

Function selection
(when the RS-232C is selected)

UTILITY RS232C

PARAMETER or

Communication speed setting (p. 61-C23)

SERIAL SPEED= 57.6

Function selection
(when the module classification is selected)

UTILITY MODULE

PARAMETER or

Slot number selection, 900 series
module classification setting (p. 61-C24)

SLOT1=OTHERS

Function selection
(when the priority is selected)

UTILITY PRIORITY

PARAMETER or

Priority setting (p. 61-C25)

PRIORITY>LIFO

To the next page

From the previous page
(P. 56-C1)

Function selection
(when the remote volume control is selected)

UTILITY REMOTE

PARAMETER or

Remote controller type setting
(when the remote controller type is set to VOLUME) (p. 62-C26)

REMOTE1>VOLUME

PARAMETER

(when the remote controller type is set to ZM-9001) (p. 62-C26)

REMOTE1>ZM-9001

PARAMETER

(when the remote controller type is set to ZM-9002) (p. 62-C26)

REMOTE1>ZM-9002

Remote-controlled channel setting* (p. 62-C27)

REMOTE1>OUTPUT1

* In the 1-channel output operation, the selectable output channel is Output 1 only.

(When the remote-controlled channel is the output channel)
Volume-controlled signal setting (p. 62-C28)

VALID FOR ALL

Function selection
(when the ANC monitor is selected)

UTILITY ANC

PARAMETER or

ANC monitor switching ON/OFF setting (p. 63-C29)

ANC MON SELECT=ON

(When the ANC monitor switching is set to ON)

Monitor switching control input terminal setting (p. 63-C30)

MON SELECT>CIN01

Interlock output control setting (p. 63-C31)

MON SEL SYNC ON

(When the interlock output control is set to ON)

Monitored ANC input channel selection (p. 63-C32)

SELECT SYNC>ANC1

Interlock output terminal setting (p. 63-C33)

SELECT SYNC>COUT01

(In the normal matrix operation)

Function selection
(when the Event activation at power-on is selected) (p. 56-C1)

UTILITY EVENT

Setting the Event to be recalled when power is switched on (p. 64-C34)

POWERON-EVENT>LAST

(In the 1-channel or 2-channel output operation)

Function selection
(when the input channel activation at power-on is selected) (p. 56-C1)

UTILITY CHANNEL

Setting the input channel to be recalled when power is switched on (p. 64-C35)

POWERON-CH>LAST

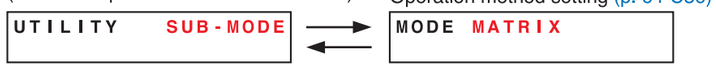
PARAMETER or

To the next page

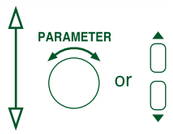
From the previous page

(P. 56-C1)

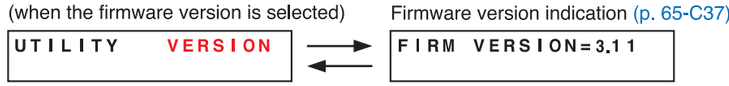
Function selection
(when the operation method is selected)



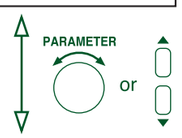
Operation method setting (p. 64-C36)



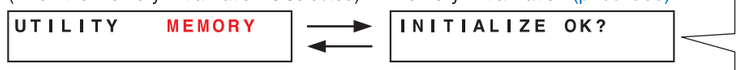
Function selection
(when the firmware version is selected)



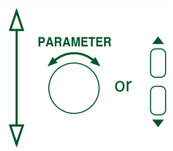
Firmware version indication (p. 65-C37)

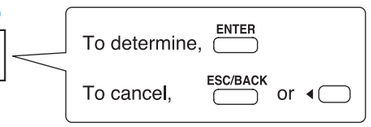


Function selection
(when the memory initialization is selected)



Memory initialization (p. 65-C38)





Function selection
(when the control input is selected)

13.7.2. Utility setting items

Unless otherwise specified, use the Parameter setting knob for each parameter selection.

(C1) Function selection

UTILITY C-IN

Setting Range	C-IN (control input, default), C-OUT (control output), POWEROFF, VOX TIME (VOX release time), RS232C, MODULE, PRIORITY, REMOTE (remote volume), ANC (ANC monitor), EVENT (Event activation at power-on), CHANNEL (input channel activation at power-on), SUB-MODE (operation method), VERSION, MEMORY (memory initialization)

- C-IN: Sets the functions to be assigned to the control input terminals, or control buttons when ZM-9001 or ZM-9002 is used. Assigning a function to these terminals or control buttons overwrites the previously set functions on them if there are.
- C-OUT: Sets the functions to be assigned to the control output terminals. Assigning a function to these terminals overwrites the previously set functions on them if there are.
- POWER OFF: Sets whether or not to save data of the volume level set in normal use state when the AC power supply is cut off.
- VOX TIME: Sets the release time (seconds) for the signals interrupted by the VOX function.
- RS232C: Sets the RS-232C communication speed.
- MODULE: Displays or sets the module classification.
- PRIORITY: Sets priority order when multiple inputs with the same priority are broadcast.
- REMOTE: Sets the input and output channels for which the volume is remotely adjusted.
- ANC: If there are 2 or more ANC inputs, sets whether or not ANC inputs to be monitored are switched.
- EVENT: Sets the Event that is activated when the unit's power is turned on. (Only in the normal matrix operation)
- CHANNEL: Sets the input channel that is activated when the unit's power is turned on. (Only in the 1-channel or 2-channel output operation)
- SUB-MODE: Sets the operation method.
- VERSION: Displays the firmware version.
- MEMORY: Initializes memory.

[When the function is set to C-IN:]

(C2) Control input number selection

C-IN01 –→ NONE

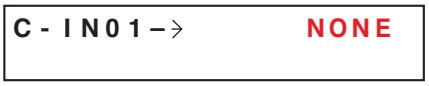
Setting Range	C-IN01 – 04 (C-IN01 – 12 when C-001T is used), ZM-IN01 – 12* (default: C-IN01) * Selectable only when the Remote controller type (p. 62-C26) is set to ZM-9001 or ZM-9002.

The screen indications ZM-IN01 – 06 or 01 – 04 correspond to the control buttons of the ZM-9001 or ZM-9002 connected to the 9000 Series amplifier's remote volume control terminal 1 (REMT VOL 1). The indications of ZM-IN with subsequent numbers correspond to ZM-9001's or ZM-9002's control buttons connected to the remote volume control terminal 2 (REMT VOL 2).
In the normal matrix operation, when the Down shift key is pressed with the control input function set to NONE and the cursor at the control input number, the Event number assigned to that control input number can be confirmed.
If no Event is assigned to that control input number, the NONE indication is displayed.

(C3) Event assignment display (Only in the normal matrix operation)

When the displayed control input (C-IN01 in this example) is set to Trigger in the Event setting, the Event number is displayed.
If the control input is not set to Trigger, the NONE indication is displayed.
Assigning a function to the control input terminal preset to "Event-Trigger" cancels the "Event-Trigger" function, being replaced with the new function.

(C4) Control input function setting

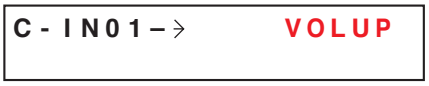


Setting Range	C-IN01 to 12: NONE (default), VOLUP (volume up), VOLDOWN (volume down), MUTE, POWER, EMG-MUTE (Cut-off by Emergency control), BGMEND* ZM-IN01 to 12: NONE, VOLUP, VOLDOWN, BGMEND* * Only in the 1-channel or 2-channel output operation

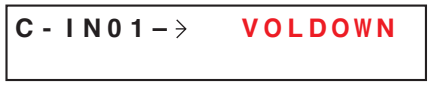
Sets the functions to be assigned to the control input terminals or control buttons of the ZM-9001 or ZM-9002.

(C5)

(When the control input function is set to VOLUP:)



(When the control input function is set to VOLDOWN:)



Assign the volume-up or volume-down function to the control input.
Closing the control input terminal increases or decreases the volume of the set input or output channel.
Assigning a function to the control input terminal or ZM-9001/9002's control button overwrites the previously set function on it if there is.

(C6)

Channel number selection (VOLUP)

Channel number selection (VOLDOWN)

Using the Input channel or Output channel selection key, select the channel number for which you want to change the volume.
One control input can change one input or output channel volume.
You can change the sound volume for a channel even with the channel off, but not adjust it while monitoring the sound.

Setting Range	IN1 – 8 (default: IN1)

(C7)

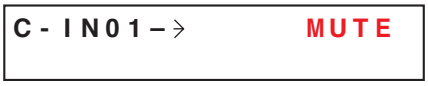
Volume increasing level setting (VOLUP)

Volume decreasing level setting (VOLDOWN)

Set the volume level (dB) to increase or decrease.

Setting Range	0.5 – 10.0 dB (default: 0.5)

(C8) (When the control input function is set to MUTE:)



Assign the function that mutes the input or output channel to the control input.
Closing the control input terminal mutes the set channel.
An input channel, when muted while in use, occupies the routed output, causing the Event-activated broadcast by the input channel with lower priority not to go through to the same output channel.
Assigning a function to this terminal overwrites the previously set function on it if there is.

(C9) Channel number selection (MUTE)

Using the Input channel or Output channel selection key, select the channel number to be muted.
One control input can mute one input or output channel.

Setting Range	IN1 – 8, OUT1 – 2, Max. OUT8 when T-001Ts are used (default: IN1)

(C10) Interlock output control setting (MUTE)

Perform ON/OFF setting for the function that closes the control output terminal in synchronization with the control input terminal closure of the set number.

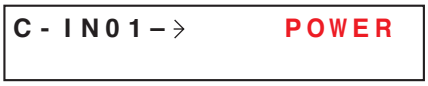
Setting Range	ON, OFF (default)

(C11) Interlock output terminal setting (MUTE)

This screen is displayed only when the interlock output control setting is set to ON.
Set the control output terminal which is closed in synchronization with the control input of the set number.
Assigning a function to this terminal overwrites the previously set function on it if there is.

Setting Range	COUT01 – 04, C-OUT01 – 12 when C-001T is used (default: COUT01) **Note:** When the interlock output control ON/OFF setting is ON.

(C12) (When the control input function is set to POWER:)



Assign the power ON/OFF function to the control input.
Power turns on when the control input terminal is closed, and turns off when the control input terminal is opened.
Assigning a function to this terminal overwrites the previously set function on it if there is.

(C13) (When the control input function is set to EMG-MUTE:)

Assign the function that simultaneously mutes all output channels to the control input. Closing the control input terminal mutes all output channels.
This function is used to mute the output provided from the unit during emergency broadcast operation.
Assigning a function to this terminal overwrites the previously set function on it if there is.

(C14) Interlock output control setting (EMG-MUTE)

Perform ON/OFF setting for the function that closes the control output terminal in synchronization with the control input terminal closure of the set number.

Setting Range	ON, OFF (default)

(C15) Interlock output terminal setting (EMG-MUTE)

This screen is displayed only when the interlock output control setting is set to ON.
Set the control output terminal which is closed in synchronization with the control input of the set number.
Assigning a function to this terminal overwrites the previously set function on it if there is.

Setting Range	COUT01 – 04, C-OUT01 – 12 when C-001T is used (default: COUT01) **Note:** When the interlock output control ON/OFF setting is ON.

(C16) (When the control input function is set to BGMEND)
(Only in the 1-channel or 2-channel output operation)

Assign the BGM end function to the control input terminal.
Closing the control input terminal turns off all Events with Priority 8 or all input channels with Priority 8.
Assigning a function to the control input terminal or ZM-9001/9002's control button overwrites the previously set function on it if there is.

[When the function is set to C-OUT:]

(C17) Control output number selection

Setting Range	01 – 04, 01 – 12 when C-001T is used (default: 01)

In the normal matrix operation, when the Down shift key is pressed with the control output function set to NONE and the cursor at the control input number, the Event number assigned to that control output number can be confirmed.
If no Event is set to that control output number, the NONE indication (nothing assigned) is displayed.

(C18) Interlock output control display (Only in the normal matrix operation)

When the displayed control output (C-OUT01 in this example) is designated as interlock output in the Event setting, its Event number is displayed.
If not designated as interlock output, the NONE indication is displayed in place of the Event number.

(C19) Control output function selection

Sets the functions to be assigned to the control output terminals.

Setting Range	NONE (default), POWER

(C20) (When the control output function is set to POWER:)

Turning on the power switch closes the control output terminal.
Assigning the function to this terminal overwrites the previously set function on it if there is.

[When the function is set to POWEROFF:]

(C21) Memory erasure or storage setting

Set whether or not to save data of the volume level set in normal operation status when the AC power supply is cut off.

Setting Range	DEL (default), SAVE

- DEL: Data not saved.
- SAVE: Saves data at the time when the Memory key is pressed.

This setting is for the case when the AC power supply is cut off.
When turned off using the unit's front-mounted power switch, the unit automatically saves the data of all the set volume levels.

[When the function is set to VOX TIME]

(C22) VOX release time setting

Sets the time (seconds) required for the muted signal to return to the original level after the VOX activating input signal decreases below the threshold level.

Setting Range	1 – 8 (default: 5)

[When the function is set to RS232C:]

(C23) Communication speed (bps) setting

Setting Range	9.6 k, 19.2 k, 38.4 k, 57.6 k (default), 115.2 k

[When the function is set to MODULE:]

(C24) Slot number selection and 900 series module classification setting

Setting Range	Slot Number	1 – 8 (default: 1)
	Module Classification	OTHERS (default), B-01, B-11, B-21, B-41, E-03, E-04, E-05, E-06, E-07, L-01, L-11, L-41, M-01, M-03, M-11, M-21, M-41, M-51, M-61, S-01, S-02, S-04, S-20S, T-01, T-02, T-12, U-01, U-03, U-11, U-12, U-13, U-14, U-21, U-43, U-61, V-01, ML-11T, NONE

Use the Left and Right shift keys to move the setting items on the screen.
For slots equipped with 9000 Series plug-in modules, their module model numbers are automatically displayed and cannot be changed. However, the D-001R is recognized and displayed as the D-001T. For slots equipped with 900 Series input modules, select their model numbers using the Parameter setting knob.
The settings performed here are merely displayed, and have no effect on the audio input and other settings.
Setting the open slot to NONE extinguishes the indicators of the corresponding Input channel and its subsequent channels on the front panel. Besides, the channels do not appear on any setting screen.

[When the function is set to PRIORITY:]

(C25) Priority setting

Set priorities when multiple inputs with the same priority level are simultaneously broadcast.

Setting Range	LIFO (default), FIFO, MIX

- LIFO: The most recent input is broadcast.
- FIFO: Input that comes first is broadcast.
- MIX: All inputs are mixed and broadcast.

[When the function is set to REMOTE:]

(C26) Remote controller type setting

Set the type of remote controller connected to the remote control input terminals.
Use the Left and Right shift keys to move the setting items on the screen.

Setting Range	Remote Volume Terminal Number	REMOTE 1, REMOTE 2
	Controller type	OFF (default), VOLUME, ZM-9001, ZM-9002

- OFF: Select this setting when no remote controller is connected.
- VOLUME: Select this setting when a normal variable resistor or variable DC power supply unit is connected.
- ZM-9001: Select this setting when the ZM-9001 is connected. This setting adds 6 control inputs.These inputs are assigned the functions in the setting screens on p.56-C1, p.49-B5, p.50-B10, and p.51-B12.
- ZM-9002: Select this setting when the ZM-9002 is connected. This setting adds 4 control inputs and 1 remote volume control. These inputs are assigned the functions in the setting screens on p.56-C1, p.49-B5, p.50-B10, and p.51-B12.

(C27) Remote-controlled channel setting
(when the remote controller type is set to VOLUME or ZM-9002)

Select the input or output channel of which volume you want to remotely control by using the control input terminals on the rear panel or ZM-9002's volume control.
The REMOTE 1 on the screen represents the REMT VOL 1 of control input terminal, and the REMOTE 2 represents the REMT VOL 2.
Use the Left and Right shift keys to move the setting items on the screen.

Setting Range	Remote Volume Terminal Number	REMOTE 1, REMOTE 2
	Remote-controlled channel	OFF, INPUT 1 – 8, OUTPUT 1 – 2, Max. OUTPUT 8 when T-001Ts are used (default for REMOTE 1: OUTPUT 1, REMOTE 2: OUTPUT 2)

(C28) Volume-controlled signal setting
(when the remote controller type is set to VOLUME or ZM-9002, and the remote-controlled channel to the output channel)

Select signals of which volume you want to remotely control.

Setting Range	ALL (default), BGM ONLY

- ALL: Adjusts signals on all output channels by means of the connected remote volume control.
- BGM ONLY: Adjusts signals (BGM) on the output channel with Priority 8 by means of the connected remote volume control.

[When the function is set to ANC:]

(C29) ANC monitor switching ON/OFF setting

If there are 2 or more ANC inputs, set whether or not ANC inputs to be monitored are switched.

Setting Range	OFF (default), ON

(C30) Monitor switching control input terminal setting (When the ANC monitor switching is set to ON)

Select the control input terminal to switch the ANC inputs* to be monitored.
Selecting the terminal overwrites the previously set function on it if there is.

Setting Range	CIN01 – 04, CIN01 – 12 when C-001T is used (default: CIN01)

Each time the designated terminal is closed, the ANC inputs to be monitored are switched in numerical order from ANC input 1.

* ANC inputs are the input channels of AN-001T Ambient Noise Sensor Input module. One AN-001T module has 2 input channels. When 2 AN-001T modules are mounted, the AN-001T's inputs in the slot with smaller number correspond to ANC Input channels 1 and 2, and another's inputs in another slot to ANC Input channels 3 and 4.

(C31) Interlock output control setting (When the ANC monitor switching is set to ON)

Perform ON/OFF setting for the function that closes the control output terminal in synchronization with the control input terminal closure of the set number.

Setting Range	OFF (default), ON

(C32) Monitored ANC input channel selection
(When the ANC monitor switching is set to ON, and the interlock output control to ON)

Select the ANC input channel. Each channel for which the monitor function is set to ON can be selected.

Setting Range	ANC 1 – 4 (Only ANC input channels for which the monitor function is ON)

(C33) Interlock output terminal setting
(When the ANC monitor switching is set to ON, and the interlock output control to ON)

Set the control output terminal which is closed in synchronization with switching to the monitored ANC input channel.
Assigning the function to this terminal overwrites the previously set function on it if there is.

Setting Range	COUT01 – 04, COUT01 – 12 when C-001T is used (default: COUT01)

[When the function is set to EVENT:] (Only in the normal matrix operation)

(C34) Setting the Event to be recalled when power is switched on

POWERON–EVENT›LAST

Setting Range	LAST (default), 01 – 32 (only for Events set for ROUTE or BASE)

Set the Event number to be activated when the unit's power is switched on.
Since no trigger is provided for Event activation at power-on, select the Event number that corresponds to either the BGM Event or the BASE Event (with [✳] mark suffixed to its Event number), both set in the ROUTE Event setting.
When LAST is selected, the unit returns to the state before power-off when turned on.
The unit operation depends on the trigger condition at power-on when there was an Event (interrupt broadcast) or function (mute or emergency mute) being activated by a level trigger before power-off.

[When the function is set to CHANNEL:] (Only in the 1-channel or 2-channel output operation)

(C35) Setting the input channel to be recalled when power is switched on

POWERON–CH›LAST

Setting Range	LAST (default), IN1 – 8

Set the input channel that is recalled at power-on.
Since no trigger is provided for input channel activation at power-on, select one from input signals (BGM) with Priority 8 (with an asterisk suffixed to the channel number).
When LAST is selected, the unit returns to the state before power-off when turned on.
The unit operation depends on the trigger condition at power-on when there was an interrupt broadcast or function (mute or emergency mute) being activated by a level trigger before power-off.

[When the function is set to SUB-MODE:]

(C36) Operation method setting

MODE MATRIX

Set the operation method.
Only the methods that meet the operation requirements can be selected.

Setting Range	MATRIX, SINGLE-OUT, BGM/PAGE

Each operation method can be selected when the following requirements are satisfied:

The 1-channel output operation (SINGLE-OUT) or normal matrix operation (MATRIX) can be selected when the A-9060S, A-9120S, or A-9240SH without T-001T installed is used.
The 2-channel output operation (BGM/PAGE) or normal matrix operation (MATRIX) can be selected when the A-9060DH or A-9120DH with ZP-001T but without T-001T installed is used.
On the conditions except above, the operation method cannot be selected but is fixed to the normal matrix operation .

Changing the operation method here and confirming it with the Memory key initialize the settings that contradict the reset operation method.

[When the function is set to VERSION:]

(C37) Firmware version indication

```
FIRM VERSION=3.11
```

Displays the firmware version number.

[When the function is set to MEMORY:]

(C38) Memory initialization

```
INITIALIZE OK?
```

Pressing the Enter key initializes all of the unit's current settings to default settings.
To cancel initialization, press the Left shift key or Escape/Back key to revert back to the previous screen.

13.8. Adjustment Mode Setting

13.8.1. Settings in adjustment mode

In the adjustment mode, audio setting parameters can be set while monitoring the output sound. Input and output gain settings, input sound source equalization*, and sound equalization for individual output zones can be performed.
The setting parameters are individually adjusted for each Event (normal matrix operation) or input channel (1-channel or 2-channel output operation). Perform the Event settings in advance when the unit is placed in normal matrix operation.

* Input sound source equalization can be performed only for channels equipped with the D-001T/R module.

The adjustment procedure is described here using an example when paging is made in Event 2 during BGM broadcast in Event 1.

Step 1. Hold down the Utility menu key for 2 seconds or more in normal use state.
The setting screen is displayed.

Step 2. Select ADJUST with the Parameter setting knob.
The screen is switched to the adjustment mode.

Note
In the adjustment mode, the Event selected in normal operation state continues to be broadcast.

Step 3. Press the Right shift key.
The Event selection screen is displayed.

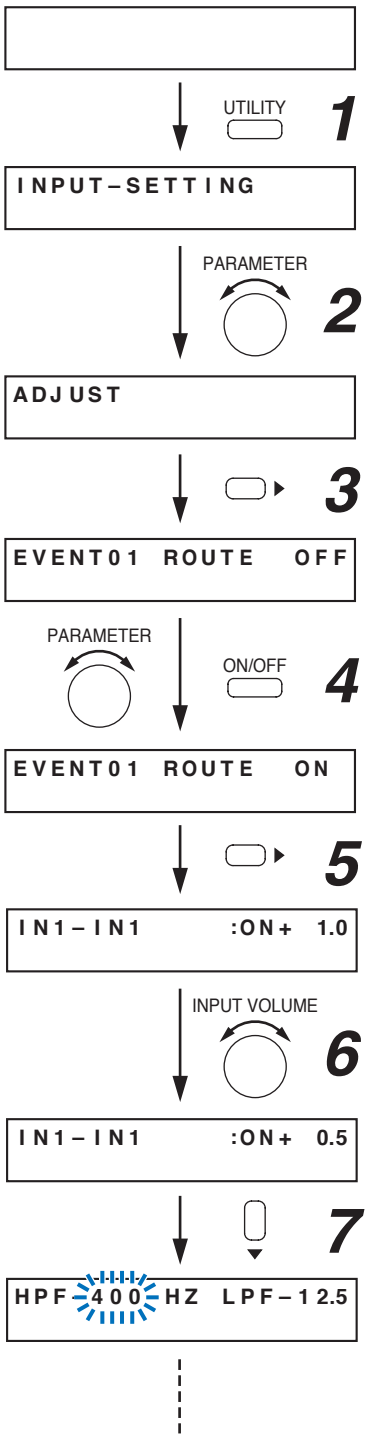
Step 4. Using the Parameter setting knob, select the Event number, then set the selected Event to ON by pressing the Input channel ON/OFF key.

Note
The Event alternates between ON and OFF each time the Input channel ON/OFF key is pressed.
Setting ON immediately activates the selected Event, and OFF terminates it.

Step 5. Press the Right shift key.
The input gain setting screen is displayed.
To stop the audio output temporarily, press the input channel ON/OFF key.

Step 6. Adjust the gain with the Input volume control.

Step 7. Press the Down shift key to display each input setting screen and adjust on-screen parameters with the Parameter setting knob.
When there are two or more setting items on the screen, select the items with the Left and Right keys.



Step 8. Return to the input gain setting screen and press the Right shift key.
The output channel selection and gain setting screen is displayed.

Note
To stop the audio output temporarily, press the output channel ON/OFF key.

Step 9. Adjust the gain with the Output volume control.
In this event, pressing the Output channel selection key permits the output channel to be selected. When multiple output channels must be changed, select all of such output channels and adjust their output volume.

Step 10. Press the Down shift key to display each output setting screen and adjust on-screen parameters with the Parameter setting knob.
When there are two or more setting items on the screen, select the items with the Left and Right keys.

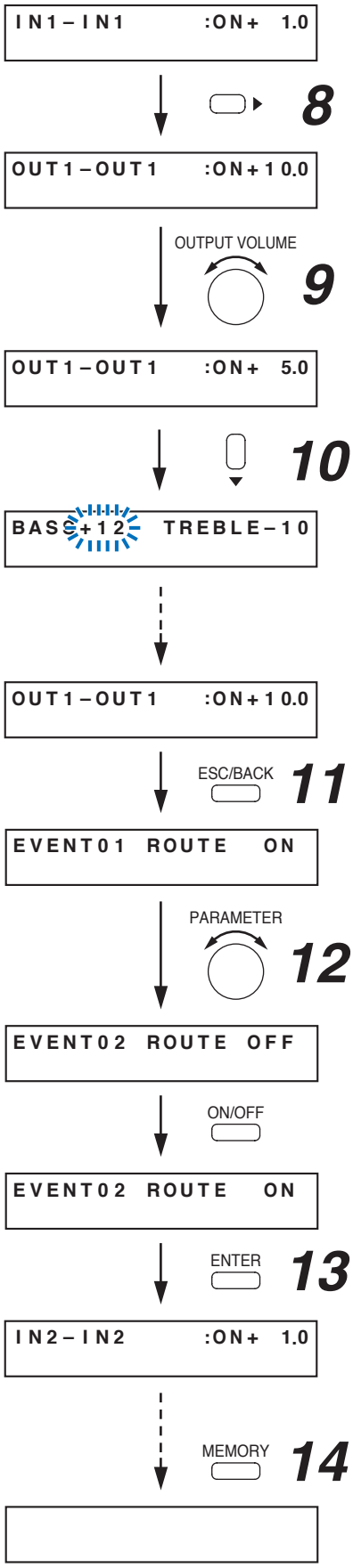
Step 11. Return to the output gain setting screen and press the Escape/Back key.
The display reverts to the Event number selection screen.

Step 12. Using the Parameter setting knob, select the Event number to be set next, then set the selected Event to ON by pressing the Input channel ON/OFF key.

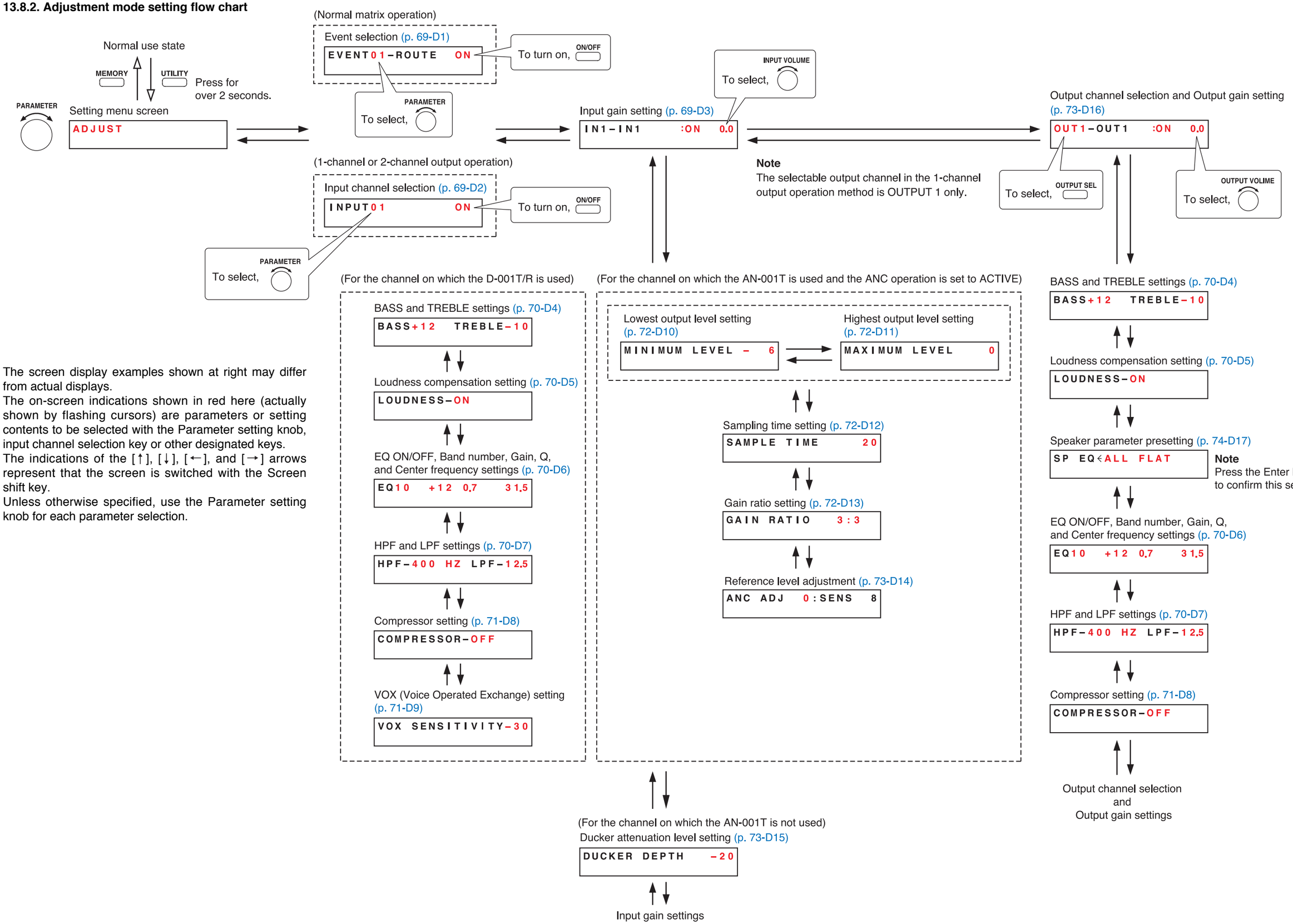
Note
Multiple Events can be set to ON. Make their adjustments one by one.

Step 13. Repeat Steps 5 – 9 to adjust each parameter.

Step 14. After all adjustments are completed, press the Memory key to exit the adjustment mode.
The display reverts to normal use state.



13.8.2. Adjustment mode setting flow chart

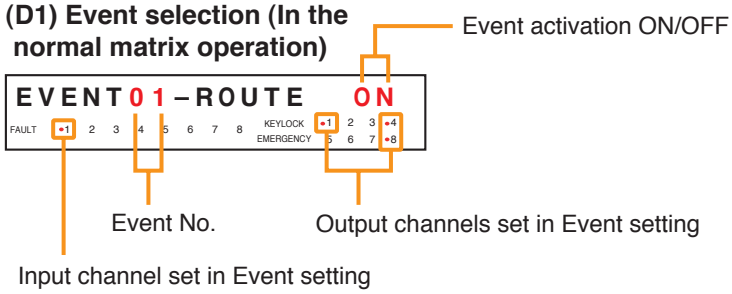

Normal use state
MEMORY
UTILITY
Press for over 2 seconds.
PARAMETER
Setting menu screen
ADJUST
(Normal matrix operation)
Event selection (p. 69-D1)
EVENT01–ROUTE ON
To turn on, ON/OFF
To select, PARAMETER
Input gain setting (p. 69-D3)
IN1–IN1 :ON 0.0
To select, INPUT VOLUME
Note
The selectable output channel in the 1-channel output operation method is OUTPUT 1 only.
Output channel selection and Output gain setting (p. 73-D16)
OUT1–OUT1 :ON 0.0
To select, OUTPUT SEL
To select, OUTPUT VOLIME
(1-channel or 2-channel output operation)
Input channel selection (p. 69-D2)
INPUT01 ON
To turn on, ON/OFF
To select, PARAMETER
(For the channel on which the D-001T/R is used)
BASS and TREBLE settings (p. 70-D4)
BASS+12 TREBLE–10
Loudness compensation setting (p. 70-D5)
LOUDNESS–ON
EQ ON/OFF, Band number, Gain, Q, and Center frequency settings (p. 70-D6)
EQ10 +12 0.7 31.5
HPF and LPF settings (p. 70-D7)
HPF–400 HZ LPF–12.5
Compressor setting (p. 71-D8)
COMPRESSOR–OFF
VOX (Voice Operated Exchange) setting (p. 71-D9)
VOX SENSITIVITY–30
(For the channel on which the AN-001T is used and the ANC operation is set to ACTIVE)
Lowest output level setting (p. 72-D10)
MINIMUM LEVEL – 6
Highest output level setting (p. 72-D11)
MAXIMUM LEVEL 0
Sampling time setting (p. 72-D12)
SAMPLE TIME 20
Gain ratio setting (p. 72-D13)
GAIN RATIO 3:3
Reference level adjustment (p. 73-D14)
ANC ADJ 0:SENS 8
(For the channel on which the AN-001T is not used)
Ducker attenuation level setting (p. 73-D15)
DUCKER DEPTH –20
Input gain settings
BASS and TREBLE settings (p. 70-D4)
BASS+12 TREBLE–10
Loudness compensation setting (p. 70-D5)
LOUDNESS–ON
Speaker parameter presetting (p. 74-D17)
SP EQ≤ALL FLAT
Note
Press the Enter key to confirm this setting.
EQ ON/OFF, Band number, Gain, Q, and Center frequency settings (p. 70-D6)
EQ10 +12 0.7 31.5
HPF and LPF settings (p. 70-D7)
HPF–400 HZ LPF–12.5
Compressor setting (p. 71-D8)
COMPRESSOR–OFF
Output channel selection and Output gain settings

The screen display examples shown at right may differ from actual displays.
The on-screen indications shown in red here (actually shown by flashing cursors) are parameters or setting contents to be selected with the Parameter setting knob, input channel selection key or other designated keys.
The indications of the [↑], [↓], [←], and [→] arrows represent that the screen is switched with the Screen shift key.
Unless otherwise specified, use the Parameter setting knob for each parameter selection.

13.8.3. Adjustment mode setting items

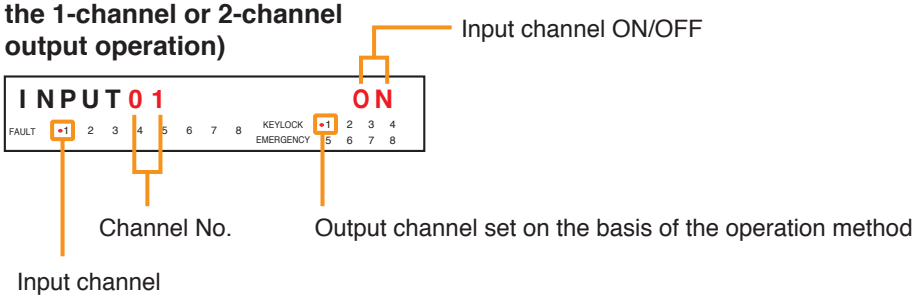
Unless otherwise specified, use the Parameter setting knob for each parameter selection.

(D1) Event selection (In the normal matrix operation)


Event activation ON/OFF
EVENT 01 – ROUTE ON
FAULT •1 2 3 4 5 6 7 8
KEYLOCK •1 2 3 •4
EMERGENCY 5 6 7 •8
Event No.
Output channels set in Event setting
Input channel set in Event setting

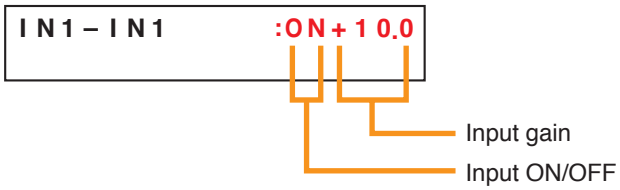
Rotate the Parameter setting knob to obtain the Event No. of which settings are desired to be adjusted.
The ON or OFF indication shows the corresponding Event activation status when the unit enters the Adjustment mode.
To adjust the Event's setting, turn the Event activation ON using the input channel ON/OFF key.
Select the Event here and press the Right shift key to make the Event-related adjustments.
You cannot activate the selected Event if the assigned input channel is off.

(D2) Input channel selection (In the 1-channel or 2-channel output operation)


Input channel ON/OFF
INPUT 01 ON
FAULT •1 2 3 4 5 6 7 8
KEYLOCK •1 2 3 4
EMERGENCY 5 6 7 8
Channel No.
Output channel set on the basis of the operation method
Input channel

Rotate the Parameter setting knob to select the input channel No. for which you want to make relevant settings.
The ON/OFF indication shows each channel status when the unit enters the Adjustment mode.
To adjust the input channel's setting, turn the input channel ON using the input channel ON/OFF key.
Select the input channel here and press the Right shift key to make its related adjustments.

(D3) Input gain setting



Adjust the input gain with the input volume control.
To stop the sound output temporarily, press the input channel ON/OFF key.
The input channel, even when set to OFF in the Adjustment mode, automatically turns ON when the unit returns to the normal use state.
Any input channel can be selected for adjustment no matter which Event or input channel is set on its selection screen.

Setting Range	Input Channel Selection	1 – 8 (default: 1)
	Channel Control	ON (default), OFF
	Channel Gain	–∞, –70.0 dB to +10.0 dB (default: 0.0 dB), 0.5 dB steps

(D4) BASS and TREBLE settings (input/output)

This screen is displayed when the D-001T or D-001R is inserted.
Rotate the Parameter setting knob to set gains.
Press the Right or Left shift key to select BASS or TREBLE, of which gain value that flashes can be adjusted.

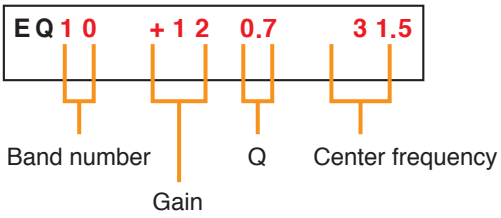
Setting Range	–12 dB to +12 dB (default: 0 dB), 1 dB steps

(D5) Loudness compensation setting (input/output)

This screen is displayed when the D-001T or D-001R is inserted.
Rotate the Parameter setting knob to set the loudness compensation function ON/OFF.
Setting ON boosts low frequencies.

Setting Range	ON, OFF (default)

(D6) EQ ON/OFF, Band number, Gain, Q, and Center frequency settings (input/output)



This screen is displayed when the D-001T or D-001R is inserted.
The indications on the right of "EQ" turn on and off as the Parameter setting knob is rotated.
When the indication is displayed, EQ is ON and a band number, gain, Q, and center frequency are displayed in this order from left to right. Use the Parameter setting knob to change each parameter, and the Left and Right keys to move the setting items.

Setting Range	EQ	ON, OFF (default)
	EQ Band Number	01 to 10 (default: 01)
	Gain	–12 dB to +12 dB (default: 0 dB), 1 dB steps
	Q	0.3, 0.5, 0.7, 1, 1.5 (default), 2, 3, 5
	Center Frequency	20, 25, 31.5 (default), 40, 50, 63, 80, 100, 125, 160, 200, 250, 315, 400, 500, 630, 800, 1 k, 1.25 k, 1.6 k, 2 k, 2.5 k, 3.15 k, 4 k, 5 k, 6.3 k, 8 k, 10 k, 12.5 k, 16 k, 20 kHz

(D7) HPF and LPF settings (input/output)

This screen is displayed when the D-001T or D-001R is inserted.
Rotate the Parameter setting knob to set the cut-off frequencies.
Press the Right or Left shift key to select HPF or LPF, of which parameter that flashes can be adjusted.

Setting Range	HPF (input/output)	OFF (default), 20, 25, 31.5, 40, 50, 63, 80, 100, 125, 160, 200, 250, 315, 400 Hz
	LPF (input/output)	OFF (default), 4 k, 5 k, 6.3 k, 8 k, 10 k, 12.5 k, 16 k, 20 kHz

(D8) Compressor setting (input/output)

This screen is displayed when the D-001T or D-001R is inserted.

Setting Range	OFF (default), 1, 2, 3, 4, 5

Use the compressor to prevent power amplifier overload or to produce more easily heard sound by averaging the audio level. The number shows the compressor's effectiveness level as shown in the table below, which can be set by rotating the Parameter setting knob.

- DEPTH = 1 (Peak limiter)
  Provides a peak limiter function that protects amplifiers and speakers against damage caused by an excessive signal input.
  This level is suited to speech applications.

- DEPTH = 2 (Peak limiter)
  Provides a peak limiter function that protects amplifiers and speakers against damage caused by an excessive signal input.
  This level is suited to musical (vocals) applications.

- DEPTH = 3 (Sonic normalizer)
  Equalizes the sound volume of reproduced BGM among CDs or pieces of music by boosting small sounds and lowering big sounds, making the entire sound volume uniform.
  This level is suited to BGM reproduction.

- DEPTH = 4 (Speech leveler)
  Makes paging calls easier to hear by equalizing the difference in speech signal volume that may result from individual differences in speaker voice volumes or variations in speaker-to-microphone distances.
  Since the volume is extensively corrected, the feedback margin narrows, making it liable to occurrences of feedback. Therefore, special care must be taken when installing microphones and speakers.
  This level is suited to microphone speech applications.

- DEPTH = 5 (Speech leveler)
  Makes paging calls easier to hear by equalizing the difference in speech signal volume that may result from individual differences in speaker voice volumes or variations in speaker-to-microphone distances.
  This level 5 is more effective than level 4 described above. Since the volume is extensively corrected, the feedback margin narrows, making it liable to occurrences of feedback. Therefore, special care must be taken when installing microphones and speakers.
  This level is suited to microphone speech applications.

Parameter	DEPTH = 1	DEPTH = 2	DEPTH = 3	DEPTH = 4	DEPTH = 5
Threshold 1	–20 dB	–20 dB	–30 dB	–78 dB	–78 dB
Threshold 2	–10 dB	–10 dB	–25 dB	–30 dB	–30 dB
Ratio 1	1 : 1	1 : 1	1 : 1	1 : 2	1 : 2.6
Ratio 2	2 : 1	2 : 1	1.25 : 1	1.25 : 2	2.5 : 1
Ratio 3	20 : 1	20 : 1	5 : 1	8 : 2	20 : 1
Attack time constant	0.1 msec	0.1 msec	0.1 msec	0.1 msec	0.1 msec
Release time constant	100 msec	1 msec	5 msec	100 msec	100 msec
COMP. output level	0 dB	0 dB	0 dB	+12 dB	+24 dB

Note: For the compression characteristics diagram, refer to p. 124.

(D9) VOX (Voice Operated Exchange) setting

This screen is displayed when the D-001T or D-001R is inserted.
Set the input signal level necessary for enabling the VOX function.

Setting Range	–40, –35, –30 (default), –25, –20, –15, –10, –5 dB

(D10) Lowest output level setting (when the AN-001T is used and ANC operation is set to ACTIVE)

MINIMUM LEVEL – 6

Set the lower limit of the ANC-activated output level.

Setting Range	–18, –15, –12, –9, –6 (default), –3 dB **Note:** Settable level is 3 dB or more below the upper limit (highest output level).

(D11) Highest output level setting (when the AN-001T is used and ANC operation is set to ACTIVE)

MAXIMUM LEVEL 0

Set the upper limit of the ANC-activated output level.

Setting Range	–15, –12, –9, –6, –3, 0 (default) dB **Note:** Settable level is 3 dB or more above the lower limit (lowest output level).

(D12) Sampling time setting (when the AN-001T is used and ANC operation is set to ACTIVE)

SAMPLE TIME 20

Set the required time to measure ambient noise. The ambient noise level is determined by being averaged over the set measuring time. When the measuring time is long, the output level changes slowly with the ambient level. However, the change in output level is not susceptible to a sudden change in ambient noise level.

Setting Range	10, 15, 20 (default), 30, 60, 120,180, 300 sec

(D13) Gain ratio setting (when the AN-001T is used and ANC operation is set to ACTIVE)

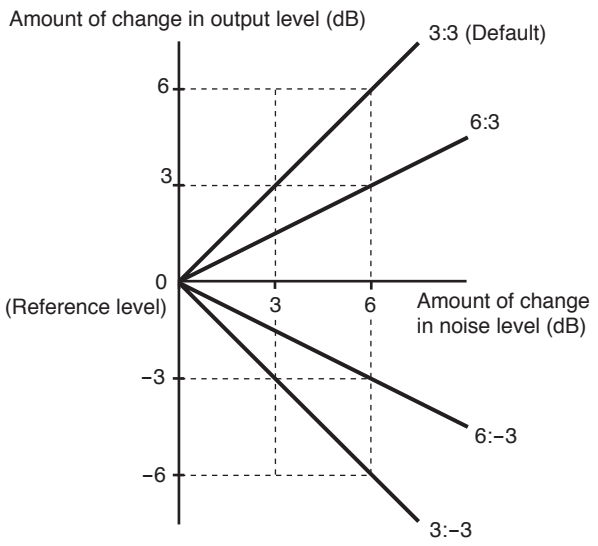
GAIN RATIO 3 : 3

Set the degree of change in the output sound level to that in ambient noise level, which is displayed as the ratio "ambient noise level : output level."

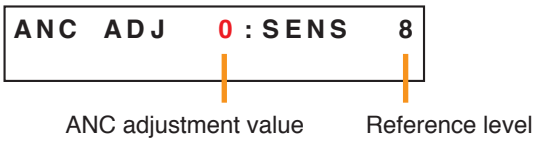
Setting Range	6:3, 5:3, 4:3, 3:3 (default), 3:4, 3:5, 3:6, 6:–3, 5:–3, 4:–3, 3:–3, 6:–3, 5:–3, 4:–3, 3:–3, 3:–4, 3:–5, 3:–6

When the ratio of output level to ambient noise level is great, the degree of change in output level becomes greater than that in ambient noise level.
The greater the amount of change in output level is, the faster the output level reaches the upper limit or lower limit, causing the sound volume not to change any more.
Contrary, when the ratio of output level to ambient noise level is small, the degree of change in output level becomes smaller than that in ambient noise level.

When the ratio of output level is positive, the output level increases as the ambient noise level increases.
When the ratio of output level is negative, the output level decreases as the ambient noise level increases.
For example, when the ratio "3 : 3" is selected, the output volume level increases by 3 dB as the ambient noise level increases by 3 dB.



(D14) Reference level adjustment (when the AN-001T is used and ANC operation is set to ACTIVE)



Adjust the reference level which is a starting point for detecting the amount of change in ambient noise level. (Refer to the previous setting item.)
Though the reference level is automatically determined according to the input sensitivity set on its setting screen, this adjustment screen allows the reference level to be manually adjusted under the actual condition that ambient noise is collected by a microphone.
Make the adjustment for the broadcast zone when it is quietest.
Adjust the on-screen ANC adjustment value with the Parameter setting knob so that the on-screen reference level becomes "0." Increase the ANC adjustment value when the reference level is higher than 0, and decrease when the reference level is lower than 0.

Setting Range	–10 to 10 dB (default: 0 dB), 1 dB steps

Note
The reference level cannot be adjusted to "0" if it is over +10 or below –10.
In this case, reset the input sensitivity (p. 41, p. 42, p. 43-A2) to the value above the current level when the reference level is higher than 10, and below the current level when smaller than –10.

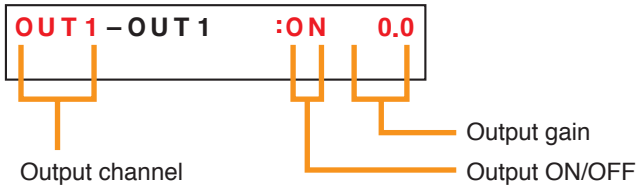
(D15) Ducker attenuation level setting (when the AN-001T is not used)

Set how much the input signal for the channel given lower priority than that of the currently set input channel should be attenuated.

Setting Range	OFF, –50, –40, –30, –20 (default), –10, 0 dB

The minus figures in dB represent amount to attenuate input signals. The larger the minus figures, the larger the amount of attenuation. Selecting "OFF" sets the attenuation to infinity, while selecting "0" sets to no attenuation, permitting all input signals to be mixed and output.

(D16) Output channel selection and Output gain setting



Select with the output channel selection key the output channel to be adjusted.
Adjust the sound volume with the output volume control.
To stop the sound output temporarily, press the output channel ON/OFF key.
The output channel, even when set to OFF here, automatically turns ON when the unit returns to the normal operation state.
You can adjust for two or more output channels by switching to each channel.
You can also adjust all output channels.

Setting Range	Output Channel Selection	OUT1 – 2, Max. 8 when T-001Ts are used (default: OUT1)
	Channel Control	ON (default), OFF
	Channel Gain	–∞, –70.0 dB to +10.0 dB (default: –20.0 dB), 0.5 dB steps

(D17) Speaker parameter presetting

Optimum equalization can be automatically set depending on the type of speaker to be used.
If this function is not used or the speaker to be used is not included in a speaker list, set "SP EQ" to ALL FLAT. When the speaker type is selected from the speaker list, the number of bands that can be set on the next EQ setting screen decreases by the number of bands to be used in the setting performed on this screen. The number of bands to be used differs depending on the type of speaker.
To perform this setting, select the speaker model from the speaker list and press the Enter key to confirm.

Setting Range	ALL FLAT (default), F-122, F-122SUBWFER (F-122 with a subwoofer), H-1, H-1SUBWOOFER (H-1 with a subwoofer), H-2, H-2SUBWOOFER (H-2 with a subwoofer), H-3, H-3SUBWOOFER (H-3 with a subwoofer), HB-1, FB-100, SW FOR F-122 (subwoofer for F-122), SR-S4 SINGLE (SR-S4 driven by a single amplifier), HX-5_E, HX-5_E LOCUT (HX-5_E for low-cut), FB-120

[Speaker EQ settings]

	ALL FLAT (Default)		
	GAIN (dB)	FREQ (Hz)	Q
EQ 01	0	31.5	1.5
EQ 02	0	63	1.5
EQ 03	0	125	1.5
EQ 04	0	250	1.5
EQ 05	0	500	1.5
EQ 06	0	1 k	1.5
EQ 07	0	2 k	1.5
EQ 08	0	5 k	1.5
EQ 09	0	8 k	1.5
EQ 10	0	16 k	1.5

	F-122			F-122SUBWFER*1		
	GAIN (dB)	FREQ (Hz)	Q	GAIN (dB)	FREQ (Hz)	Q
EQ 01	Settable EQ bands in the EQ setting screen			Settable EQ bands in the EQ setting screen		
EQ 02						
EQ 03						
EQ 04 (HPF)	——	37.5	0.5	——	45	0.5
EQ 05 (HPF)	——	37.5	0.7	——	45	0.7
EQ 06	+11.5	85	2.871	+6.5	80	1.414
EQ 07	–2.5	212	0.667	–4.5	180	0.667
EQ 08	–8	900	2.871	–8	900	2.871
EQ 09	+8	10 k	0.267	+8	11.2 k	0.267
EQ 10 (LPF)	——	20 k	0.7	——	20 k	0.7

*1 F-122 with a subwoofer

	H-1			H-1SUBWOOFER*2		
	GAIN (dB)	FREQ (Hz)	Q	GAIN (dB)	FREQ (Hz)	Q
EQ 01	Settable EQ bands in the EQ setting screen			Settable EQ bands in the EQ setting screen		
EQ 02						
EQ 03						
EQ 04						
EQ 05						
EQ 06 (HPF)	——	118	0.707	——	118	0.707
EQ 07	+10	125	1.8	+4	125	1.8
EQ 08	–6.5	220	1.414	–6.5	220	1.414
EQ 09	+1.5	5 k	0.305	+1.5	5 k	0.305
EQ 10 (LPF)	——	15.8 k	0.5	——	15.8 k	0.5

*2 H-1 with a subwoofer

	H-2			H-2SUBWOOFER*3		
	GAIN (dB)	FREQ (Hz)	Q	GAIN (dB)	FREQ (Hz)	Q
EQ 01	Settable EQ bands in the EQ setting screen			Settable EQ bands in the EQ setting screen		
EQ 02						
EQ 03						
EQ 04						
EQ 05						
EQ 06 (HPF)	——	63	0.707	——	63	0.707
EQ 07	+10	100	1.871	+2.5	100	1.871
EQ 08	–5	200	1.414	–5	200	1.414
EQ 09	+1.5	5 k	0.305	+1.5	5 k	0.305
EQ 10 (LPF)	——	15.8 k	0.5	——	15.8 k	0.5

*3 H-2 with a subwoofer

	H-3			H-3SUBWOOFER*4		
	GAIN (dB)	FREQ (Hz)	Q	GAIN (dB)	FREQ (Hz)	Q
EQ 01	Settable EQ bands in the EQ setting screen			Settable EQ bands in the EQ setting screen		
EQ 02						
EQ 03						
EQ 04						
EQ 05						
EQ 06 (HPF)	——	63	0.707	——	63	0.707
EQ 07	+9	100	2.871	+5	100	2.871
EQ 08	–8	220	2.871	–8	220	2.871
EQ 09	+5	500	2.871	+5	500	2.871
EQ 10	+1.5	5 k	0.305	+1.5	5 k	0.305

*4 H-3 with a subwoofer

	HB-1		
	GAIN (dB)	FREQ (Hz)	Q
EQ 01	Settable EQ bands in the EQ setting screen		
EQ 02			
EQ 03			
EQ 04			
EQ 05			
EQ 06			
EQ 07			
EQ 08			
EQ 09 (HPF)	——	40	1
EQ 10 (LPF)	——	100	1

	FB-100		
	GAIN (dB)	FREQ (Hz)	Q
EQ 01	Settable EQ bands in the EQ setting screen		
EQ 02			
EQ 03			
EQ 04			
EQ 05			
EQ 06			
EQ 07			
EQ 08			
EQ 09 (HPF)	——	40	1
EQ 10 (LPF)	——	100	1

	SW FOR F-122*5		
	GAIN (dB)	FREQ (Hz)	Q
EQ 01	Settable EQ bands in the EQ setting screen		
EQ 02			
EQ 03			
EQ 04			
EQ 05			
EQ 06			
EQ 07			
EQ 08			
EQ 09 (LPF)	——	100	0.5
EQ 10	+2.5	112	0.667

*5 Subwoofer for F-122

	SR-S4 SINGLE*6		
	GAIN (dB)	FREQ (Hz)	Q
EQ 01	Settable EQ bands in the EQ setting screen		
EQ 02			
EQ 03			
EQ 04			
EQ 05			
EQ 06			
EQ 07			
EQ 08			
EQ 09 (HPF)	——	60	1.226
EQ 10	+5	16 k	1.414

*6 SR-S4 driven by a single amplifier

	HX-5_E*7		
	GAIN (dB)	FREQ (Hz)	Q
EQ 01	Settable EQ bands in the EQ setting screen		
EQ 02			
EQ 03			
EQ 04			
EQ 05			
EQ 06 (HPF)	——	60	2.053
EQ 07	+2	65	1.414
EQ 08	–3	800	0.7
EQ 09	–4	2.5 k	2.997
EQ 10	+5	5 k	0.305

*7 HX-5 Series

	HX-5_E LOCUT*8		
	GAIN (dB)	FREQ (Hz)	Q
EQ 01	Settable EQ bands in the EQ setting screen		
EQ 02			
EQ 03			
EQ 04			
EQ 05			
EQ 06			
EQ 07 (HPF)	——	90	1.30656
EQ 08	–3	800	0.7
EQ 09	–4	2.5 k	2.997
EQ 10	+5	5 k	0.305

*8 HX-5 Series for low-cut use

	FB-120*9		
	GAIN (dB)	FREQ (Hz)	Q
EQ 01	Settable EQ bands in the EQ setting screen		
EQ 02			
EQ 03			
EQ 04			
EQ 05			
EQ 06			
EQ 07			
EQ 08			
EQ 09 (HPF)	——	40	2.053
EQ 10 (LPF)	——	100	1

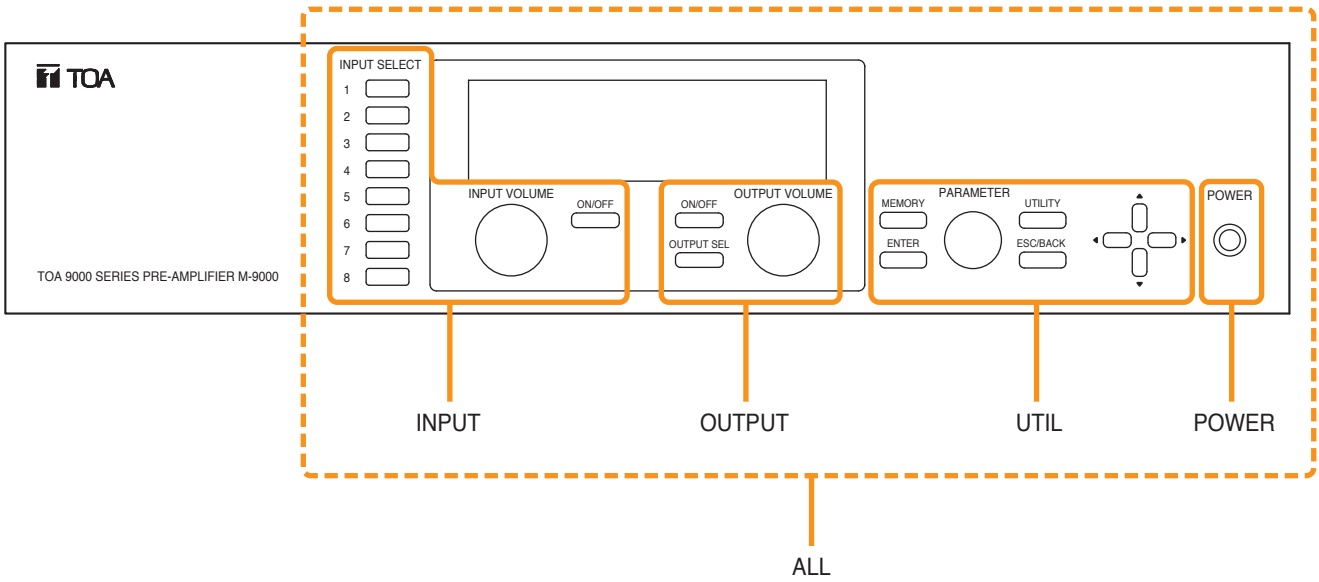
*9 FB-120 Series

13.9. Key Lock Function Setting

The key lock function prevents equipment malfunctions by disabling operation of each key.

13.9.1. Keys that can be locked

This figure represents the M-9000.



ALL: Locks all keys simultaneously.

INPUT: Locks the Input channel selection keys, Input volume control, and Input channel ON/OFF key. It is also possible to individually set whether or not to lock for each channel.

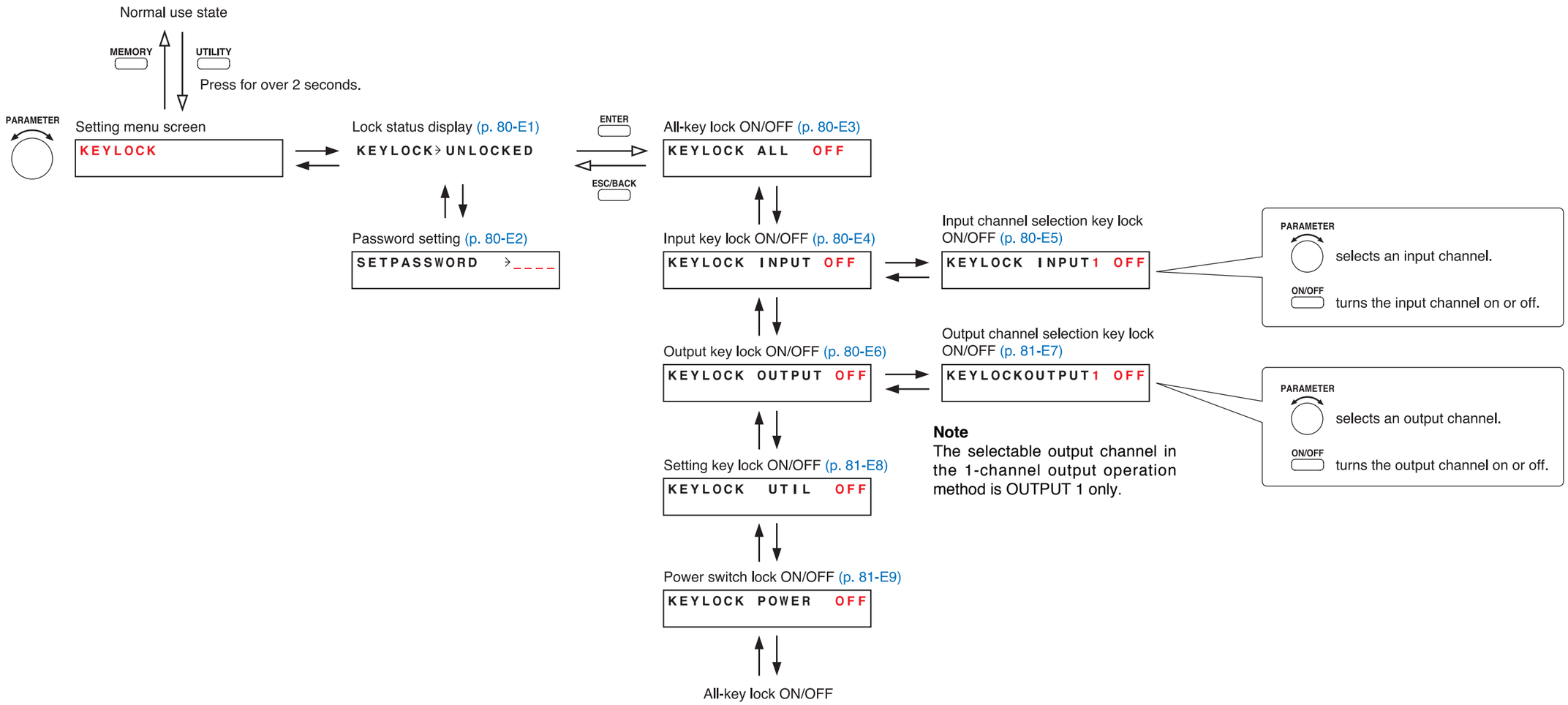
OUTPUT: Locks the Output channel selection key, Output volume control, and Output channel ON/OFF key. It is also possible to individually set whether or not to lock for each channel.

UTIL: Locks the Utility menu key, Memory key, Enter key, Escape/Back key, and Parameter setting knob.

POWER: Locks the Power switch.

13.9.2. Key lock function setting flow chart

The screen display examples shown below may differ from actual displays.
The on-screen indications shown in red here (actually shown by flashing cursors) are parameters or setting contents to be selected with the Parameter setting knob, input channel selection key or other designated keys.
The indications of the [↑], [↓], [←], and [→] arrows represent that the screen is switched with the Screen shift key.
Unless otherwise specified, use the Parameter setting knob for each parameter selection.



Note
The selectable output channel in the 1-channel output operation method is OUTPUT 1 only.

13.9.3. Key lock function setting items

Set the keys to be locked on the key lock function setting screen. The KEYLOCK indication lights after setting completion. Since a password is requested if the locked key is pressed, enter the password.
Unless otherwise specified, use the Parameter setting knob for each parameter selection.

(E1) Lock status display

(No key is locked.)

(Any key except the Utility key is locked.)

Pressing the Enter key gives access to each key lock setting screen.

(E2) Password setting

Passwords can be set only when the keys are not locked.
Use the Input channel selection key to set the password and use the Left and Right shift keys to move characters.

(E3) All-key lock ON/OFF

Selecting ON locks all keys located on the front panel.
If ON/OFF settings differ from key to key, the [- - -] indication is displayed when this screen appears.

(E4) Input key lock ON/OFF

Locks all Input channel selection keys, Input channel ON/OFF key, and Input volume control.
If ON/OFF settings differ from channel to channel, the [- - -] indication is displayed when this screen appears.

(E5) Input channel selection key lock ON/OFF

Locks the Input channel selection key, Input channel ON/OFF key, and Input volume control for each input channel.
Select with the Parameter setting knob the input channel to be locked, and set the key lock function to ON with the Input channel ON/OFF key.

(E6) Output key lock ON/OFF

Locks all Output channel selection keys, Output channel ON/OFF key, and Output volume control.
If ON/OFF settings differ from channel to channel, the [- - -] indication is displayed when this screen appears.

(E7) Output channel selection key lock ON/OFF

Locks the Output channel selection key, Output channel ON/OFF key, and Output volume control for each Output channel.
Select with the Parameter setting knob the Output channel to be locked, and set the key lock function to ON with the Output channel ON/OFF key.
The Output channel selection key selects an output channel one by one only in numerical order starting from Channel 1. So, when the output channel selection key is locked at an output channel, the subsequent output channels are not used unless the locked key is unlocked at the channel by entering a password.

(E8) Setting key lock ON/OFF

Selecting ON locks Utility key, Memory key, Enter key, Escape/Back key, and Parameter setting knob.

(E9) Power switch lock ON/OFF

Locks the Power switch.
Setting this function disables the power switch to be turned off when the unit's power is on. (Power can be turned on whenever the unit is off irrespective of the power switch lock ON/OFF status.)
To power off the unit, perform the remote control or turn the power switch off in the normal use state after setting the power switch lock function to OFF here and exiting the function setting mode.

13.9.4. Password setting

When using a password, set the password before performing lock setting for each key.

Step 1. Hold down the Utility menu key for 2 seconds or more in normal use state.
The setting screen is displayed.

Step 2. Select KEYLOCK with the Parameter setting knob.

Step 3. Press the Right shift key.
Lock status is displayed.

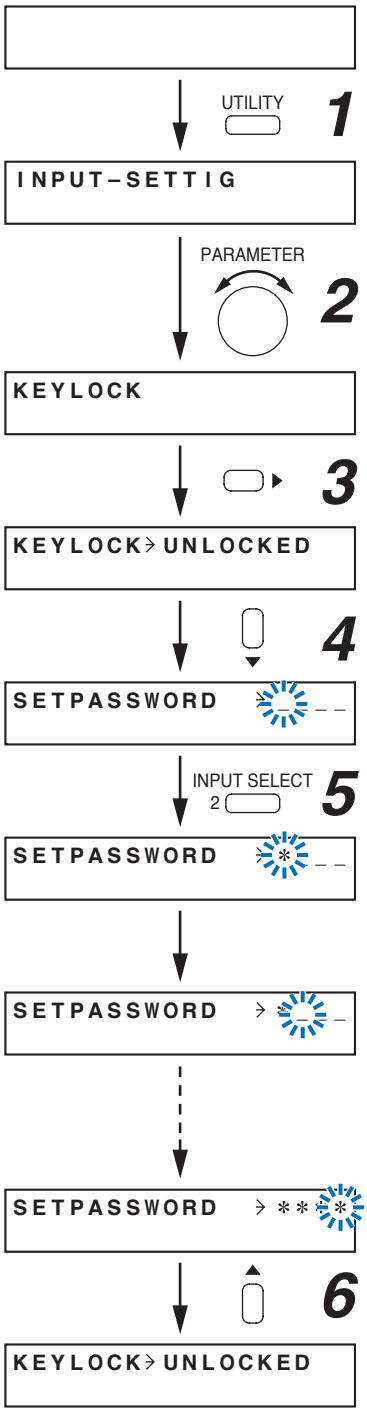
Step 4. Press the Down shift key.
The Password setting screen is displayed.

Note
No password is factory-preset.
(The [_ _ _ _] indication is displayed.)

Step 5. Enter a password using the Input channel selection keys (1 – 8).
The [-] indication on the extreme left flashes first for character entry.
Entering a character changes the [-] indication into [✳].
Use up to 4 characters to set the password.

Step 6. Press the Up shift key after setting completion.
The display returns to the key lock status screen.

Step 7. Perform key lock setting.
Advance to Step 4 on the next page.



13.9.5. Key lock setting operation

Step 1. Hold down the Utility menu key for 2 seconds or more in normal use state.
The setting screen is displayed.

Step 2. Select KEYLOCK with the Parameter setting knob.

Step 3. Press the Right shift key.
Lock status is displayed.

Step 4. Press the Enter key.
The all-key lock ON/OFF setting screen is displayed.

Step 5. Set keys to be locked.

5-1. All-key lock setting
Set "KEYLOCK ALL" function to ON with the Parameter setting knob.

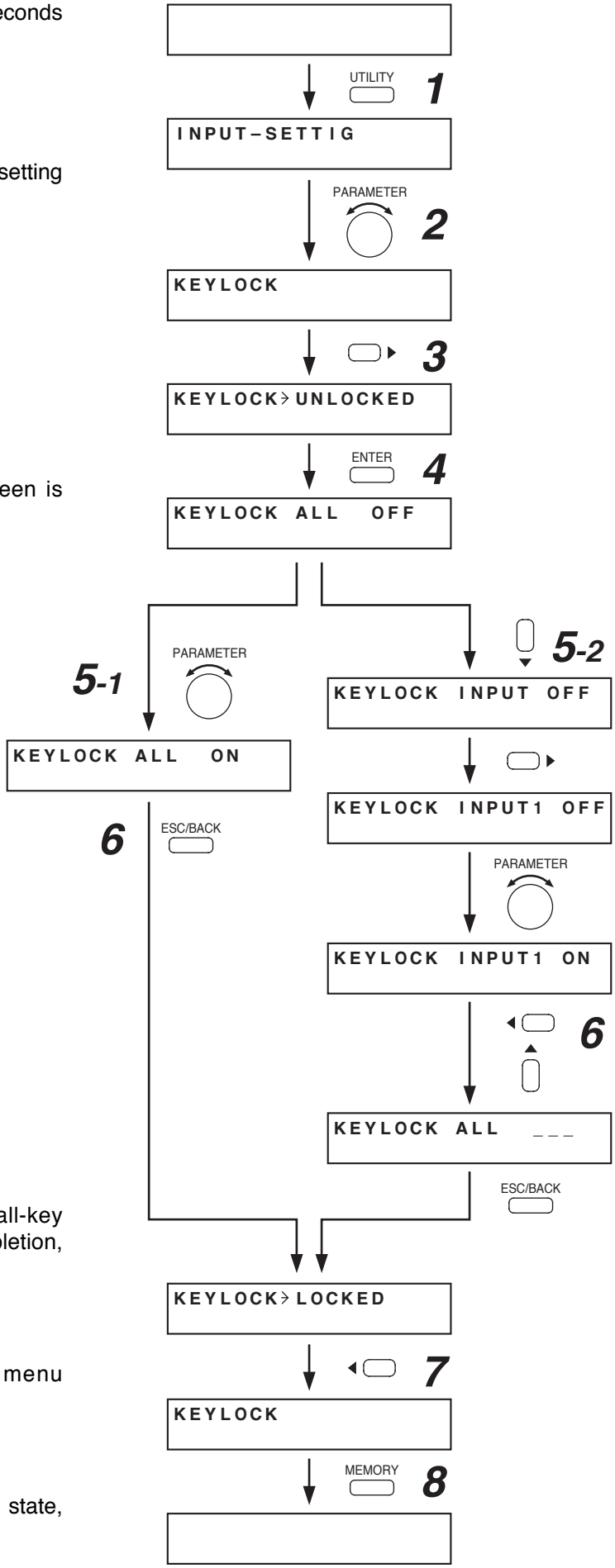
5-2. Selected key(s) lock setting
Press the Shift key to display individual setting screen for each key, and perform the ON/OFF setting with the Parameter setting knob.
You can set each input or output channel key to ON or OFF by selecting it on the screen.

Note
The setting flow on the right is an example for locking the input channel 1 key.

Step 6. Press the shift key to return to the all-key lock setting screen after setting completion, then press the Escape/Back key.

Step 7. Press the Left shift key.
The display returns to the setting menu screen.

Step 8. Press the Memory key.
The display returns to the normal use state, making the key lock setting valid.



14. RESTORING FACTORY DEFAULT SETTING

Follow the procedures below to return all settings to default values while using the unit in the matrix mode. Details of the default values are shown on the next page, "Default Setting Table."

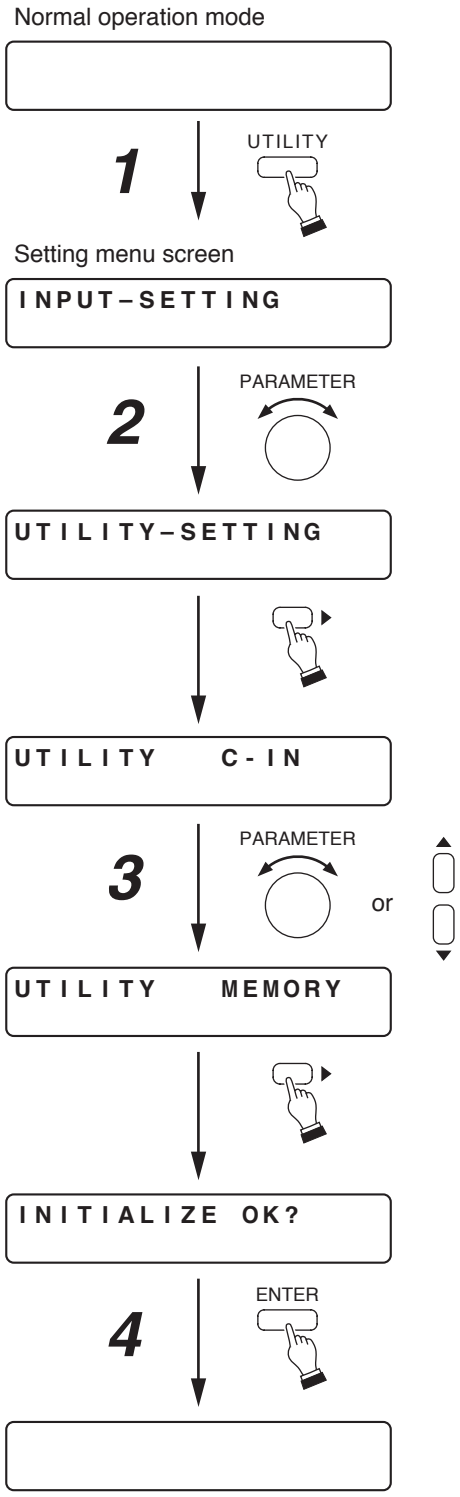
Step 1. Hold down the Utility menu key for 2 seconds or more when in normal use state.

Step 2. Using the Parameter setting knob, select UTILITY SETTING, then press the Right shift key.

Step 3. Using the Parameter setting knob or UP/Down shift key, select MEMORY, then press the Right shift key.

Step 4. Press the Enter key when the "INITIALIZE OK?" indication is displayed.

To cancel initialization, press the Left shift key or Escape/Back key to revert back to the previous screen.



14.1. Default Setting Table

14.1.1. Input settings

Setting Item	Default
Input Channel Name	(IN1 – 8)

[Settings when the 900 series module is used]

Trigger*1	NONE
Zone 1 – 4*1	OFF

[Settings when the D-001T/R is used]

Input Sensitivity	–10 dB
Phantom Power	OFF
VOX Function*2	OFF
Trigger*1	NONE
Zone 1 – 4*1	OFF

[Settings when the ZP-001T is used]

Pre-paging Tone	OFF
Operation Mode	PAGING PORT

[Settings when the AN-001T is used]

ANC Operation ON/OFF	BYPASS
Input Sensitivity	–10 dB
Phantom Power	OFF
ANC-Activated Output	OUT1
Monitor ON/OFF	OFF
Monitor Output Channel	OUT1 (When the monitor ON/OFF setting is ON)

[Settings when the AN-001T is not used]

Priority	8 (7 only when ZP-001T is used)
Ducker	OFF

*1 Only in the 1-channel or 2-channel output operation
*2 Only in the normal matrix operation

14.1.2. Audio output settings

Setting Item	Default
Output Channel Name	(OUT1 – 8)

14.1.3. Event settings

Setting Item	Default
Event Number	01
Event Classification	NONE

[When Event classification is set to ROUTE]

Input Channel	IN1
Output Channel	OUT1
Trigger	NONE
Trigger Type	LEVEL (When the trigger setting is C-IN or ZM-IN)
Busy input terminal	NONE (When Event other than BGM Events is set)
Interlock Output Control	OFF
Interlock Output	COUT01 (When the interlock output control is ON)

[When Event classification is set to BGMEND]

Trigger	C-IN01

[When Event classification is set to BASE]

Event Number	01
Trigger	C-IN01

14.1.4. Utility settings

Setting Item	Default
Function Selection	C-IN

[When the function selection is set to C-IN]

Control Input Number	01
Control Input Function Selection	NONE
Channel Number	IN1
Volume Up/Down Level	0.5
Interlock Output Control	OFF
Interlock Output Terminal	COUT01 (When the interlock output control is ON)

[When the function selection is set to C-OUT]

Control Output Number	01
Control Output Function Selection	NONE

[When the function selection is set to POWEROFF]

Memory Storage at Power-Off	DEL

[When the function selection is set to VOX TIME]

VOX Release Time	5

[When the function selection is set to RS232C]

Communication Speed (bps)	57.6k

[When the function selection is set to MODULE]

Slot Number	1
Module Classification	OTHERS

[When the function selection is set to PRIORITY]

Priority	LIFO

[When the function selection is set to REMOTE]

Remote Controller Type	OFF
Remote-Controlled Channel	REMOTE1 terminal for OUTPUT1 control, REMOTE2 terminal for OUTPUT2 control
Volume-Controlled Signal	ALL

[When the function selection is set to ANC]

ANC Monitor Switching ON/OFF	OFF
Control Input Terminal	CIN01
Interlock Output Control	OFF
Interlock Output Terminal	COUT01 (When the interlock output control is ON)

[When the function selection is set to EVENT]

Event Activation at Power-On	LAST

[When the function selection is set to CHANNEL]

Input Channel Activation at Power-On	LAST

14.1.5. Adjustment mode settings

Input Channel Settings

Setting Item	Default
Input Channel Selection	IN1
Channel Control	ON
Channel Gain	0.0 dB

[Settings when the D-001T/R is used]

BASS/TREBLE	0 dB
Loudness Compensation	OFF
EQ	OFF
EQ Band Number	01 (When EQ = ON and EQ band number = 01)
Gain	0 dB (When EQ = ON and EQ band number = 01)
Q	1.5 (When EQ = ON and EQ band number = 01)
Center Frequency	31.5 Hz (When EQ = ON and EQ band number = 01)
HPF	OFF
LPF	OFF
Compressor	OFF
VOX Sensitivity	–30 dB

[Settings when the AN-001T is used]

Lowest Output Level	–6
Highest Output Level	0
Sampling Time	20
Gain Ratio	3:3
Reference Level	0 dB

[Settings when the AN-001T is not used]

Ducker Attenuation Level	–20 dB

Output Channel Settings

Output Channel Selection	OUT1
Channel Control	ON
Channel Gain	–20.0 dB
BASS/TREBLE	0 dB
Loudness Compensation	OFF
Speaker Parameter Presetting	ALL FLAT
EQ	OFF
EQ Band Number	01 (When EQ = ON and EQ band number = 01)
Gain	0 dB (When EQ = ON and EQ band number = 01)
Q	1.5 (When EQ = ON and EQ band number = 01)
Center Frequency	31.5 Hz (When EQ = ON and EQ band number = 01)
HPF	OFF
LPF	OFF
Compressor	OFF

15. MODULE INSTALLATION

Important Be sure to detach the power cord when inserting or removing any module.

15.1. Module Combination

The unit is designed to provide an up to 8-input/8-output configuration in combination with its optional modules.
Inputs are configured by only using the modules. (No input terminals are located on the rear panel.)
For outputs, 2 output channels are provided on the rear panel and can be expanded by adding modules.
There are 4 control inputs and 4 control outputs on the rear panel, which can be expanded to a maximum of 12 inputs and 12 outputs with the additional use of 1 module.
900 Series input modules can also be used together with 9000 Series modules.

9000 series modules		No. of inputs	Maximum mountable No.
Model No.	Module function		
D-001T	2-channel Mic/Line input	2	4
D-001R	2-channel Mic/Line input	2	4
ZP-001T	Zone paging input	1	1
T-001T	2-channel output	—	3
C-001T	Remote control	—	1
AN-001T	2-channel ambient noise sensor input	2	2

900 series modules	1	8

15.2. Channel Numbers and Terminal Numbers

- Input channel numbers 1, 2, 3... begin with the input(s) of the module inserted into Slot No. 1.
- Output channels 1 and 2 correspond to the unit's rear panel-mounted preamplifier output terminals 1 and 2, respectively. When output modules are added, the output channel numbers are 3, 4, 5....beginning with the output of the module inserted into Slot 5.
- Control input and output terminal numbers correspond to control input and output terminals 1 – 4 on the unit's rear panel. When a C-001T module is added, the additional terminal numbers are from 5 to 12.

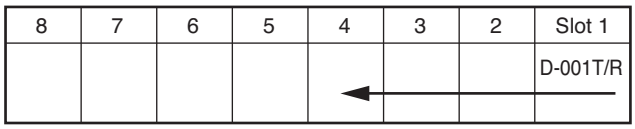
15.3. Module Installation

The unit's rear panel-mounted module slot numbers are 1 – 8 from right to left as viewed from the rear.
There are rules for module installation. Follow the procedures below to mount the modules.

Notes
- Avoid touching parts and terminals on the module's circuit board when inserting or removing the module.
- Mount the module in the right place and certainly secure it with screws.

Step 1. Insert the D-001T or D-001R module into the slots, starting in order from Slot 1 without leaving slots open in between.

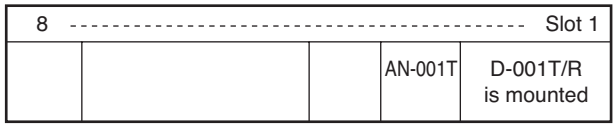
Note
Only Slots 1 – 4 can be used for the D-001T and D-001R modules. The main unit recognizes the D-001R as the D-001T.



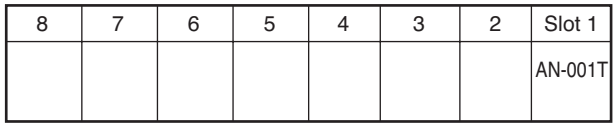
Step 2. Insert the AN-001T module into the slots in order without leaving slots open in between.

Notes

- Up to 8 audio inputs including AN-001T's inputs can be used per amplifier.
- The mounting slots of the AN-001T and D-001T/R may be changed between them.



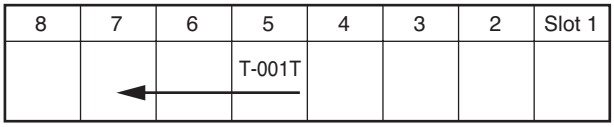
(Example when no D-001T/R is mounted)



Step 3. Insert the T-001T module into the slots, starting in order from Slot 5 without leaving slots open in between.

Note

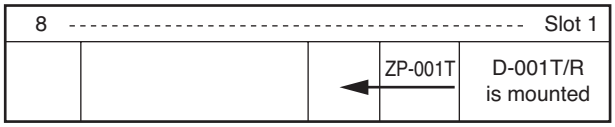
Only Slots 5 – 7 can be used for the T-001T module.



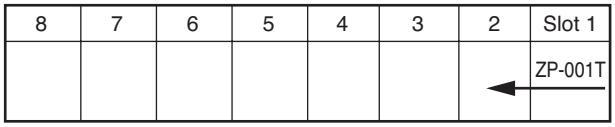
Step 4. Insert the ZP-001T module(s) into the slots in order without leaving slots open in between.

Note

Start the insertion from Slot No. 1 when neither D-001T/R nor AN-001T module is used.



(Example when neither D-001T/R nor AN-001T is mounted)

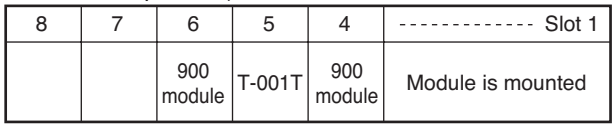


Step 5. Insert the 900 Series input modules.

Notes

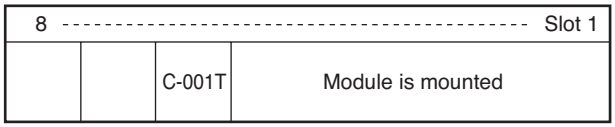
- When Slot No. 1 is occupied with the D-001T/R or AN-001T, Slot No. 8 is not used for the 900 Series module. Likewise, when Slot No. 2 is occupied, Slot No. 7 is not used; when Slot No. 3 is occupied, Slot No. 6 is not used; and when Slot No. 4 is occupied, Slot No. 5 is not used.
- Insert the 900 Series input modules in order without leaving slots open in between.
- Use the open slots in increasing slot number order even if the T-001T module is mounted in an intermediate position.
- Insert modules into the slots, starting in order from Slot No. 1 when not mounting the D-001T/R, AN-001T, and ZP-001T.

(Example when the T-001T is mounted in an intermediate position)



(Example when neither D-001T/R, AN-001T, nor ZP-001T is mounted)

Step 6. Insert the C-001T module in the open slot with the lowest slot number.

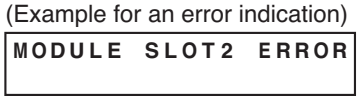


Step 7. Attach the blank panels supplied with the unit onto open slots.

Note

If modules are not correctly installed, an error indication is displayed on the VFD screen when the power is turned on. In such cases, check the above procedures again and reinsert the modules.

(Example for an error indication)



15.4. Module Installation Examples

[Example of audio 8 IN/8 OUT and control 12 IN/12 OUT configuration]

Slot No. 8	7	6	5	4	3	2	1
C-001T Control 8 inputs 8 outputs	T-001T Audio 2 outputs	T-001T Audio 2 outputs	T-001T Audio 2 outputs	D-001T/R Audio 2 inputs	D-001T/R Audio 2 inputs	D-001T/R Audio 2 inputs	D-001T/R Audio 2 inputs

[Example of audio 5 IN/4 OUT, control 4 IN/4 OUT, and ambient noise sensor 2 IN configuration]

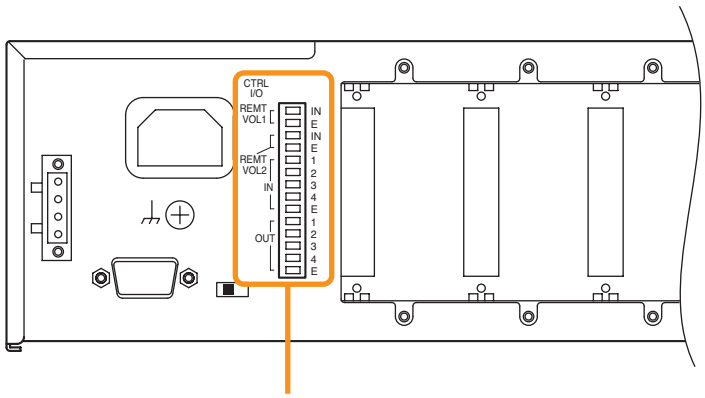
8	7	6	5	4	3	2	1
Open slot (Attach the blank panel)	Open slot (Attach the blank panel)	900 series module Audio 1 input	T-001T Audio 2 outputs	900 series module Audio 1 input	900 series module Audio 1 input	AN-001T Ambient noise sensor 2 inputs	D-001T/R Audio 2 inputs

[Example of audio 2 IN/4 OUT, control 4 IN/4 OUT, and ambient noise sensor 2 IN configuration]

8	7	6	5	4	3	2	1
Open slot (Attach the blank panel)	Open slot (Attach the blank panel)	Open slot (Attach the blank panel)	T-001T Audio 2 outputs	Open slot (Attach the blank panel)	900 series module Audio 1 input	ZP-001T Audio 1 input	AN-001T Ambient noise sensor 2 inputs

16. CONNECTIONS

16.1. Control I/O Terminal Connections



Control-I/O connection terminal

[Remote volume control terminals 1, 2 (REMT VOL 1, REMT VOL 2]

Volume of the input or output channels can be remotely adjusted by connecting a variable resistor or variable DC power supply unit. (The REMT VOL 1 terminal is factory-preset to output 1, and the REMT VOL 2 to output 2.)
Connect a 10 kΩ (linear taper) variable resistor or input the DC voltage of 0 to +10 V as shown on the next page.
The larger the variable resistor resistance, the larger the volume is, and the smaller its resistance, the smaller the volume is.
Connecting the ZM-9001 Zone Manager adds 6 control inputs and allows the equipped 6 control buttons to perform the functions assigned for input's or output's channel volume up/down, Event activation, or BGMEND (BGM broadcast end).
Connecting the ZM-9002 Zone Manager adds 1 volume control and 4 control inputs. Volume of the input or output channels can be remotely adjusted with the volume control, and the 4 control buttons can be assigned the same functions as those of the ZM-9001.

Note: To avoid interference due to noise, use shielded cables.

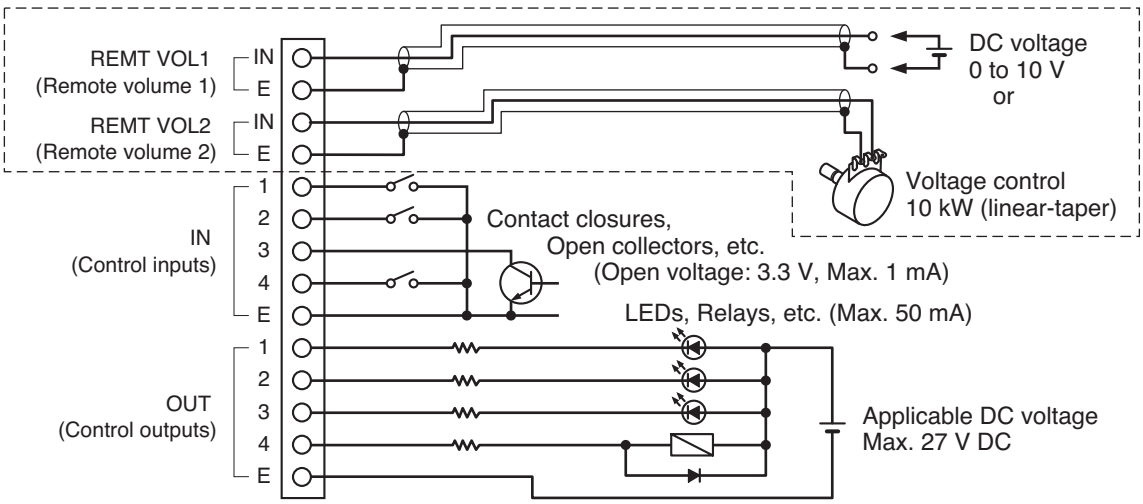
[Control input terminals 1 – 4 (IN 1 – 4)]

Connect switch contacts, etc. to these terminals.
Open voltage is 3.3 V, and the short-circuit current is 1 mA or less.

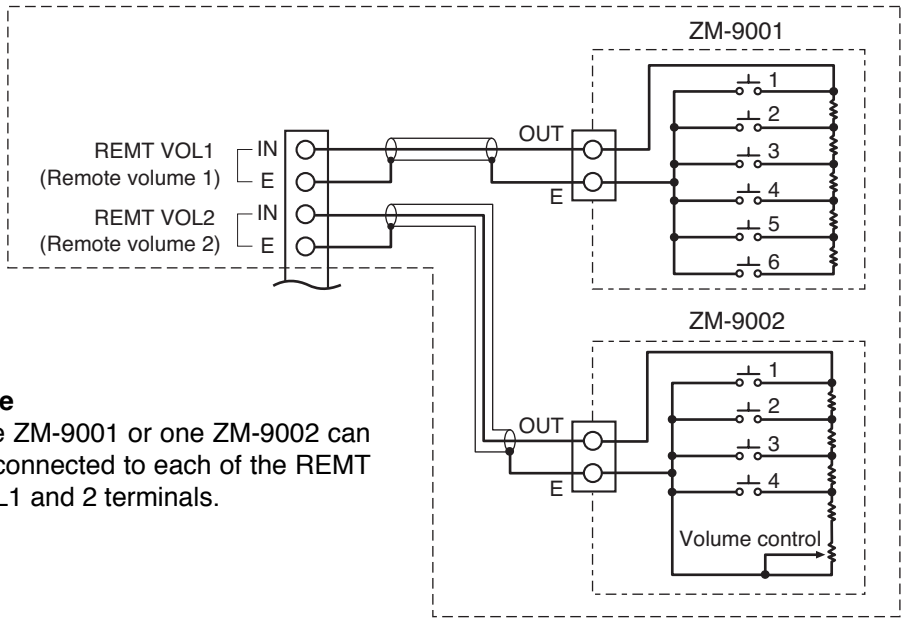
[Control output terminals 1 – 4 (OUT 1 – 4)]

Use these terminals to activate LEDs, relays, and other external equipment.
Maximum operating current is 50 mA, and the maximum applicable voltage is +27 V.

16.1.1. When a variable resistor or variable DC power supply unit is connected



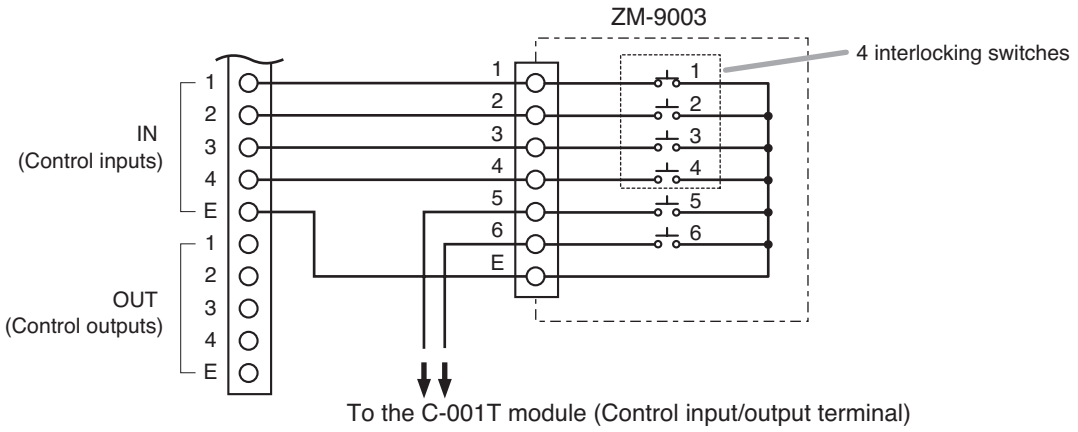
16.1.2. When the ZM-9001 or ZM-9002 is connected



Note
One ZM-9001 or one ZM-9002 can be connected to each of the REMT VOL1 and 2 terminals.

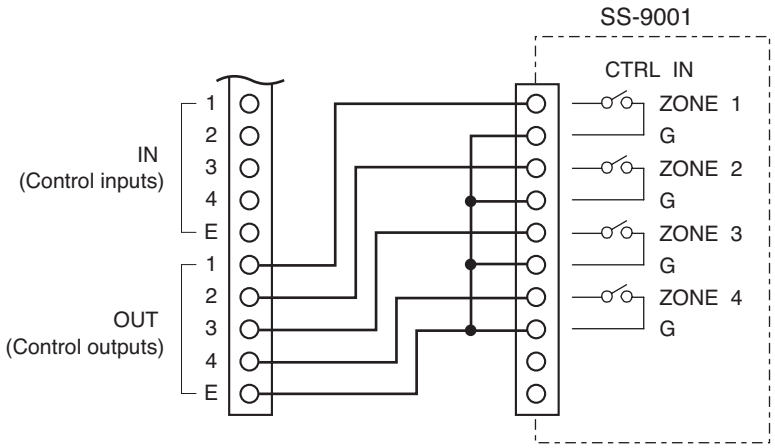
16.1.3. When the ZM-9003 is connected

Output terminal Nos. 1 – 4 of the ZM-9003 are internally connected to the interlocking switches and Nos. 5 and 6 to the momentary switches.
Connect these terminals to the Control input terminals of the main unit or C-001T depending on applications.



16.1.4. When the SS-9001 is connected

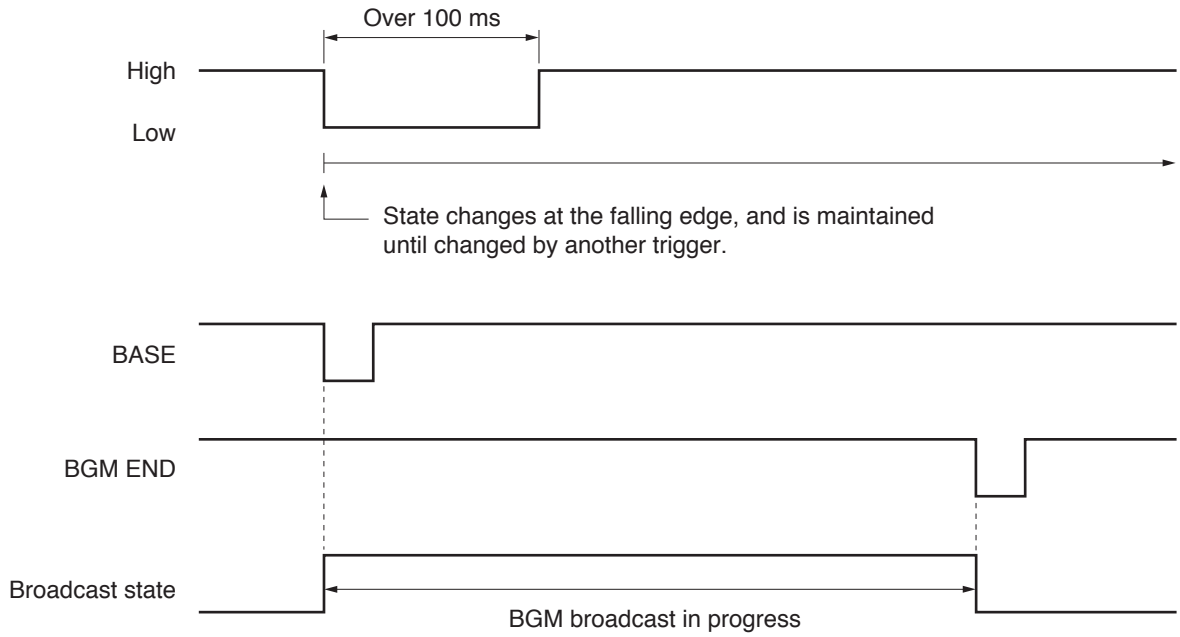
The control input terminals of SS-9001 are polarized non-voltage contact inputs. With the interlock output terminal setting in the Event setting, the SS-9001's internal relays can be activated. Make necessary connections depending on applications.



16.1.5. Operation by control input

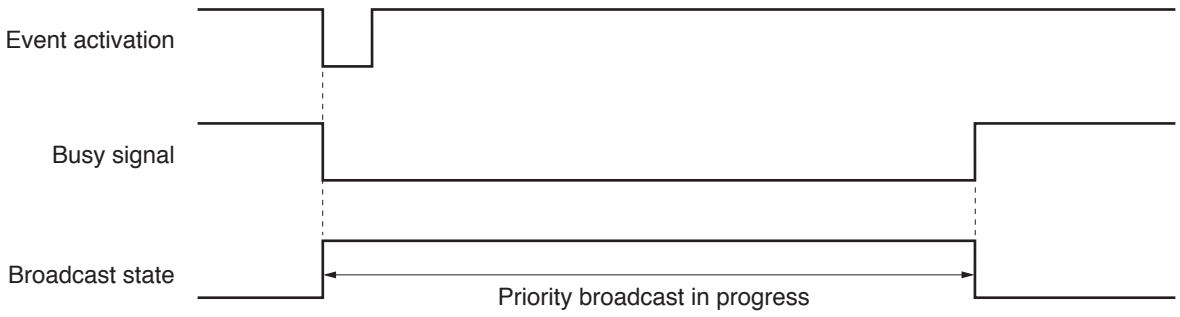
[Pulse trigger]

Use this method to activate operations for which no definite end can be defined, such as Volume Up/Down, BGM and Base pattern activation, and BGM End. Minimum pulse width is 100 ms.



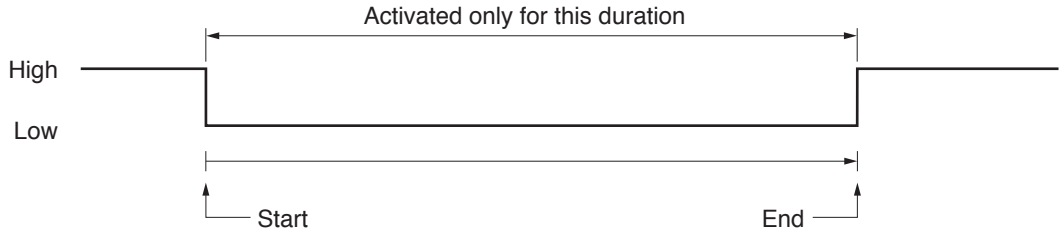
[Event activation by pulse trigger, and a busy signal provided]

When the external equipment that provides a busy signal during its operation is used for priority broadcasts, the state of broadcast and busy signal after Event is pulse-triggered is as follows.

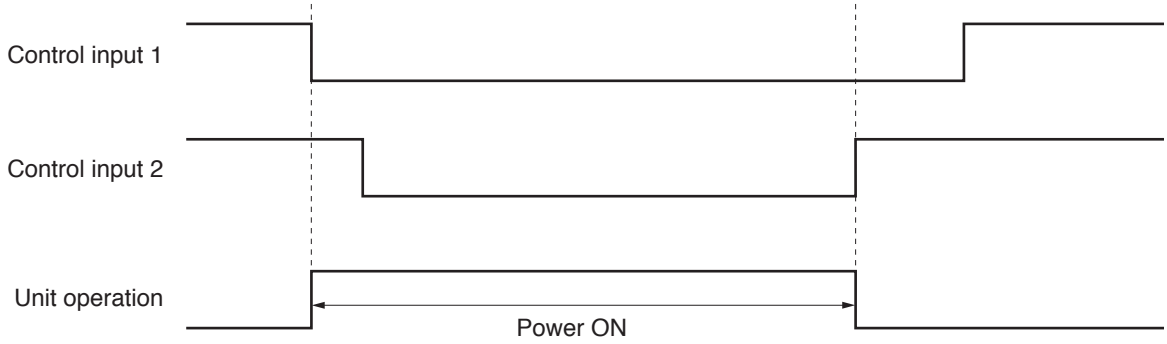


[Level trigger]

Use this method to activate "MUTE," "POWER" (Power ON/OFF remote function), "EMG-MUTE" (Cut-off by emergency control), interrupt broadcasts, and other operations of which start and end must be defined.



For "MUTE," "POWER," and "EMG-MUTE" functions, if operated at the front panel (EMG-MUTE does not accept this access from the front panel) or if other control input to which the same function is assigned is fed, their states are changed by subsequent panel operations or control input activations. The following example shows the change in operation when POWER (Power ON/OFF remote function) is assigned to Control inputs 1 and 2;



Control input 1 will still keep the power ON after Control input 2 turns the power OFF, however the unit's power is OFF.

16.2. Speaker Output Terminal Connections

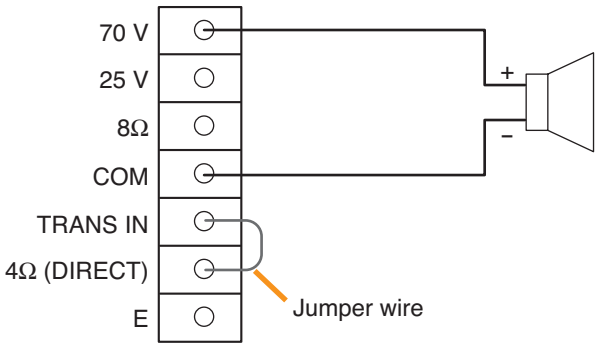
16.2.1. A-9060S and A-9120S

The A-9060S and A-9120S are equipped with speaker output terminals of 70 V, 25 V, and 8 Ω transformer output, and 4 Ω direct output.

[Transformer output terminal connection]

Connect the supplied jumper wire* between 4 Ω (DIRECT) and TRANS IN terminals as shown below.
Then, connect speakers to COM terminal and 70 V, 25 V, or 8 Ω terminal.

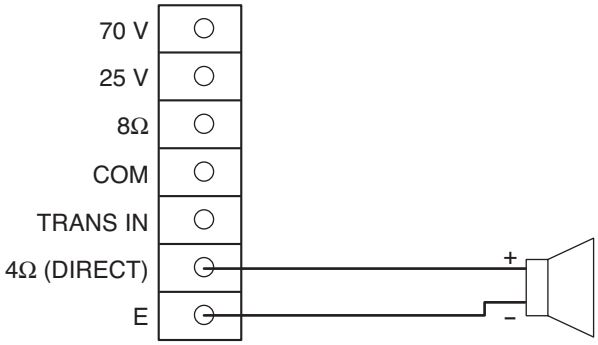
* So wired in the supplied plug when shipped from the factory.



[Direct output terminal connection]

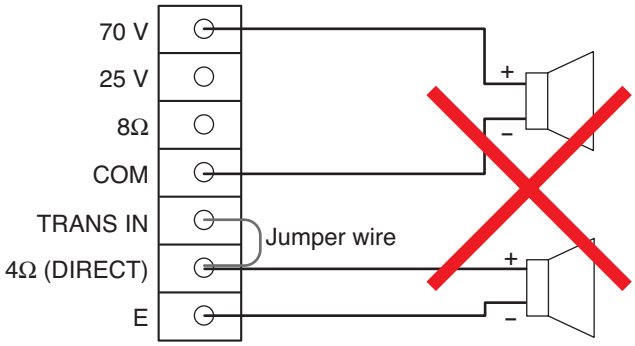
Remove the jumper wire* from the supplied plug, and connect a speaker to E and 4 Ω (DIRECT) terminals.

* Wired in the supplied plug when shipped from the factory.



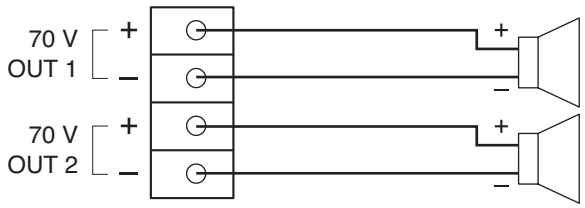
Note

Never connect speakers to the transformer output and 4 Ω direct output at the same time.
The amplifier could fail due to overload on it.



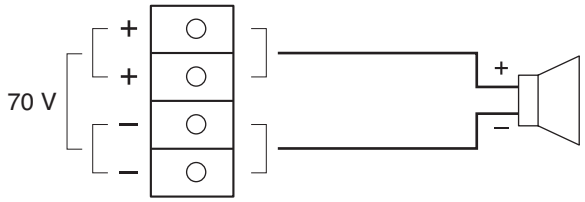
16.2.2. A-9060DH and A-9120DH

The speaker output terminals of the A-9060DH and A-9120DH are designed for 70 V line applications.
Both CH 1 and CH 2 outputs are provided on the 4P terminal block.
Connect the speaker cables to each positive terminal (+) and negative terminal (–) individually.



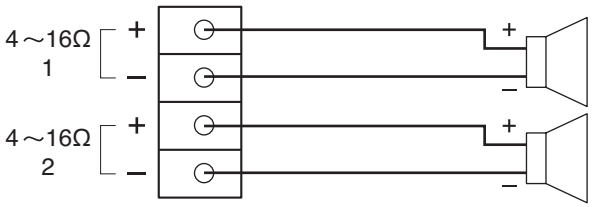
16.2.3. A-9240SH

The speaker output terminal of the A-9240SH is designed for 70 V line applications.
CH 1 output is provided on the 4P terminal block.
Connect the speaker cables to the positive (+) and negative (–) terminals.



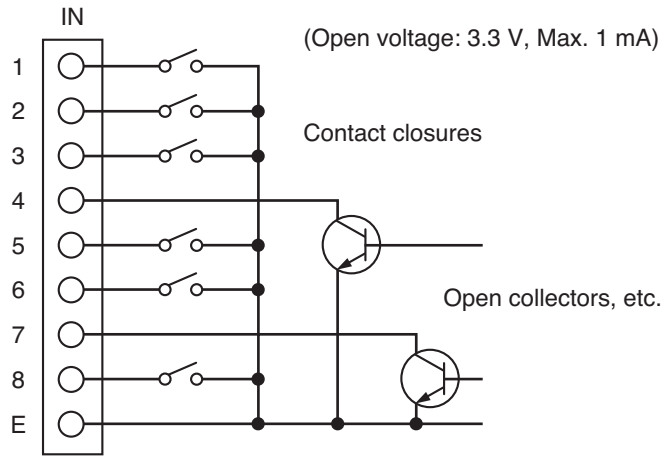
16.2.4. A-9120DL

Connect the speaker of 4 – 16 Ω to the speaker output terminals of the A-9210DL.
Both CH 1 and CH 2 outputs are provided on the 4P terminal block.
Connect the speaker cables to each positive terminal (+) and negative terminal (–) individually.



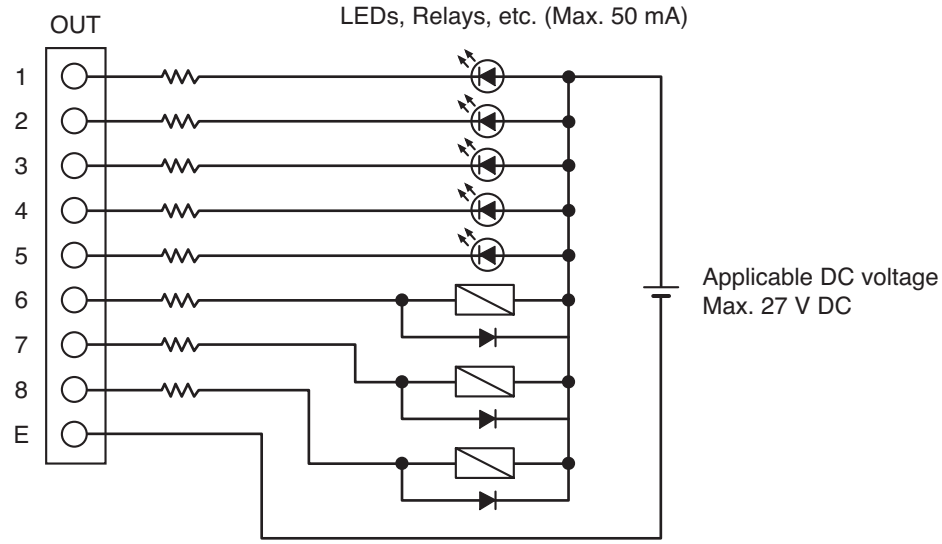
16.3. C-001T Module Connections

16.3.1. Control input terminal



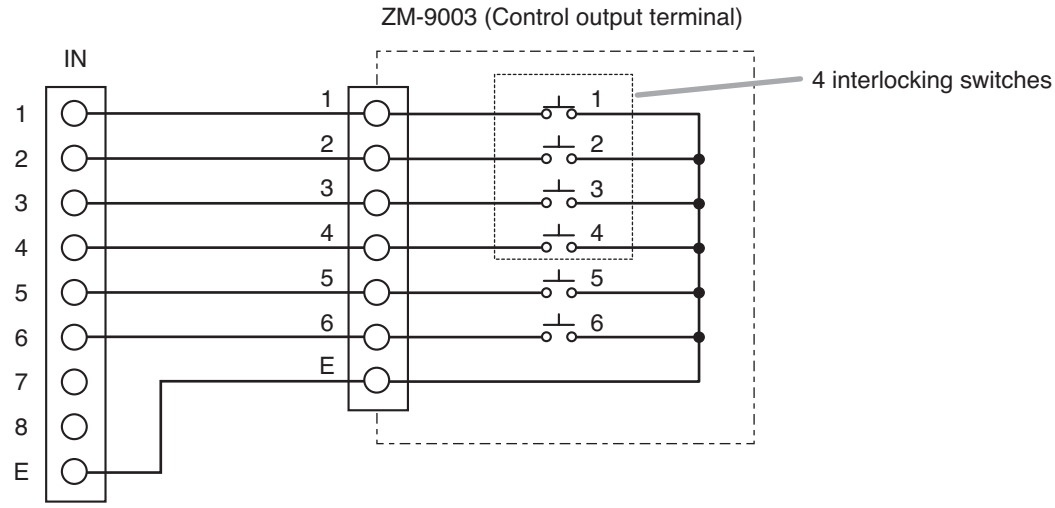
For operation by means of the control inputs, refer to p. 94 "Operation by control input".

16.3.2. Control output terminal



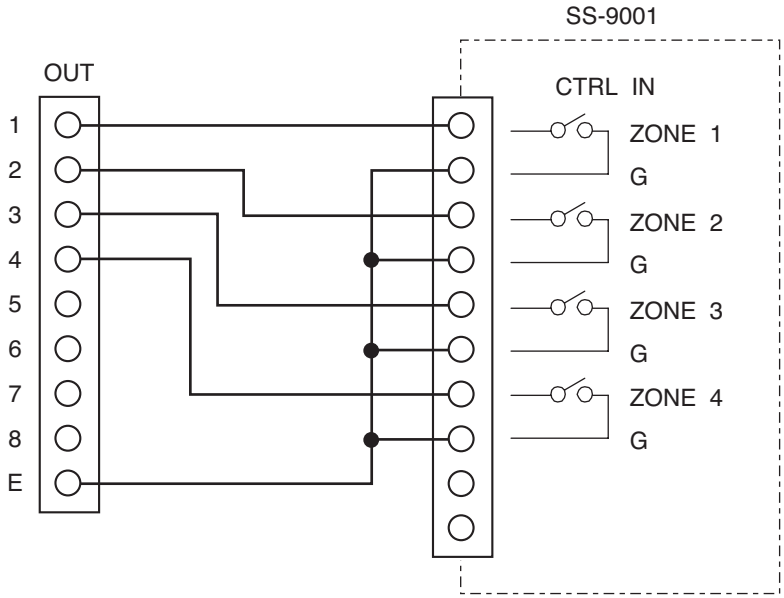
16.3.3. Connecting the ZM-9003

Output terminal Nos. 1 – 4 of the ZM-9003 are internally connected to the interlocking switches and Nos. 5 and 6 to the momentary switches.
Connect these terminals to the Control input terminals of the main unit or C-001T depending on applications.



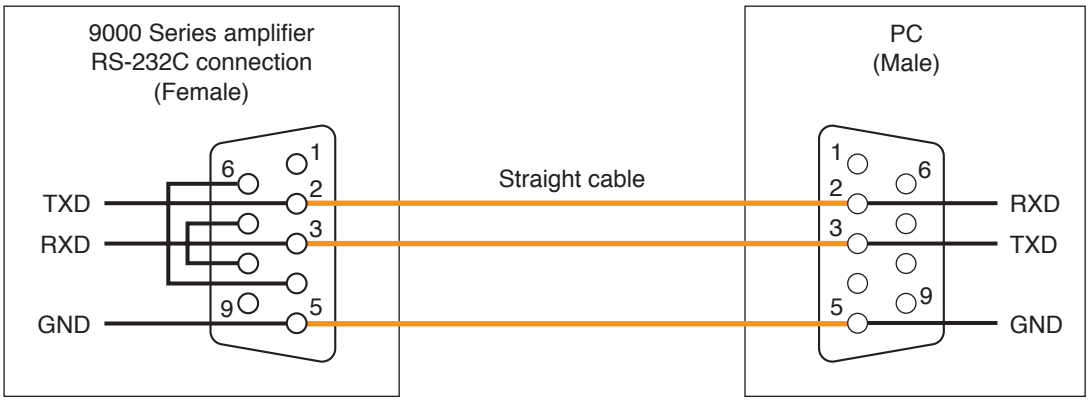
16.3.4. Connecting the SS-9001

The control input terminals of SS-9001 are polarized non-voltage contact inputs. With the interlock output terminal setting in the Event setting, the SS-9001's internal relays can be activated. Make necessary connections depending on applications.



16.4. RS-232C Connector Connection

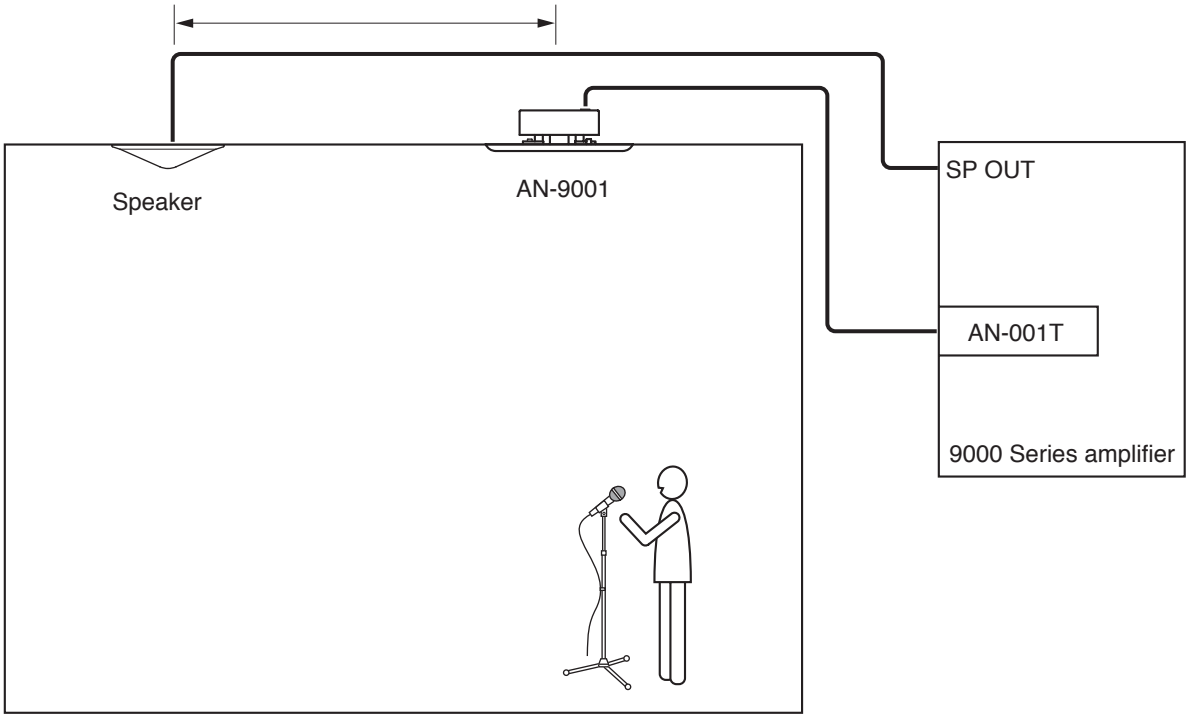
Use the straight cable when connecting a PC to the unit's RS-232C connector (9P, female).



16.5. AN-001T and AN-9001 Connections

The AN-001T and AN-9001 are connected as illustrated below and used to control the speaker sound volume in a room or such closed space.

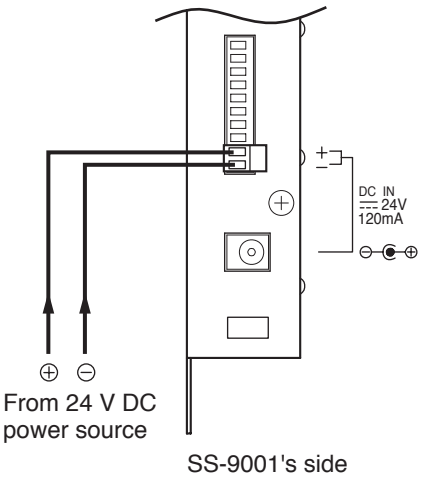
Note
Keep the AN-9001 as distant as possible from a sound source (speaker, water supply pipe, or air conditioning).
If installed close to a sound source, the AN-9001 could sense it as ambient noise to control the speaker sound volume.



16.6. Power Source Connections to the SS-9001

16.6.1. When using a 24 V DC power source

Connect a 24V DC power source to the SS-9001's DC input terminal pins.



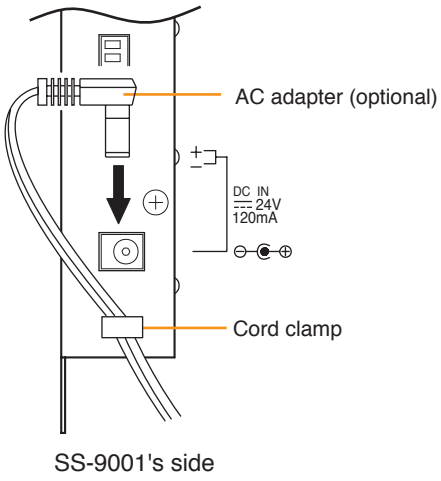
Notes

- The DC power supply unit should be capable of supplying 200 mA or more.
- The DC power fed to this terminal should be from 21.6 to 26.4 V.

  If the input voltage exceeds this range, the SS-9001 may malfunction or fail.

16.6.2.When using the optional AC adapter

Connect the optional AD-246 AC Adapter to the SS-9001's DC input terminal.
Pinch the adapter cord with the cord clamp to securely fix the cord.



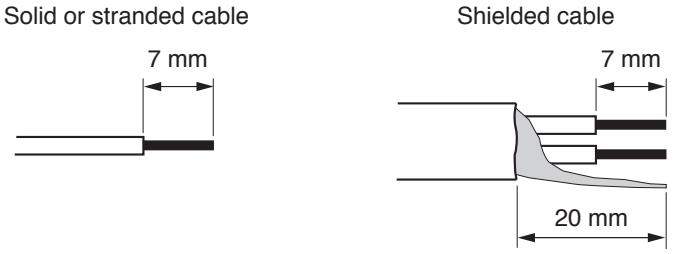
16.7. Removable Terminal Plug Connection

Be sure to use the supplied removable terminal plugs for connections to the removable terminal blocks.

Cautions

- Be sure to use shielded cables for audio signal lines and for the ZM-9001/9002 control lines.
- Avoid soldering stranded or shielded cable, as contact resistance may increase when the cable is tightened and the solder is crushed, possibly resulting in an excessive rise in joint temperatures.

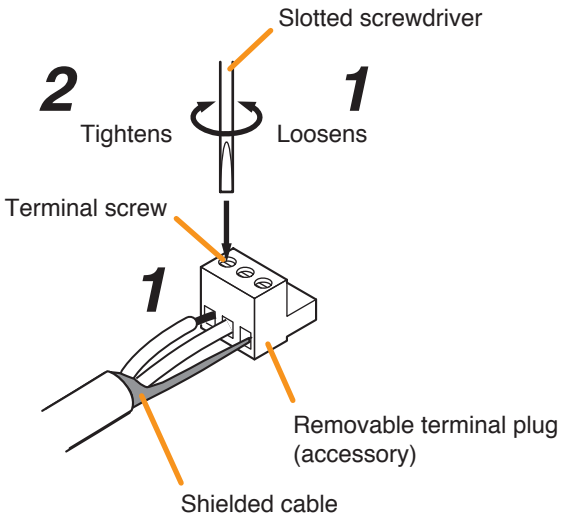
Cable end treatment



Connector connection

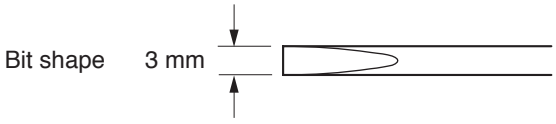
Step 1. Loosen the terminal screw, then insert the cable.

Step 2. Retighten the terminal screw. (Pull on the cable to ensure it is securely connected.)



Tip

Recommended slotted screwdriver type: Screwdriver with 3 mm blade width

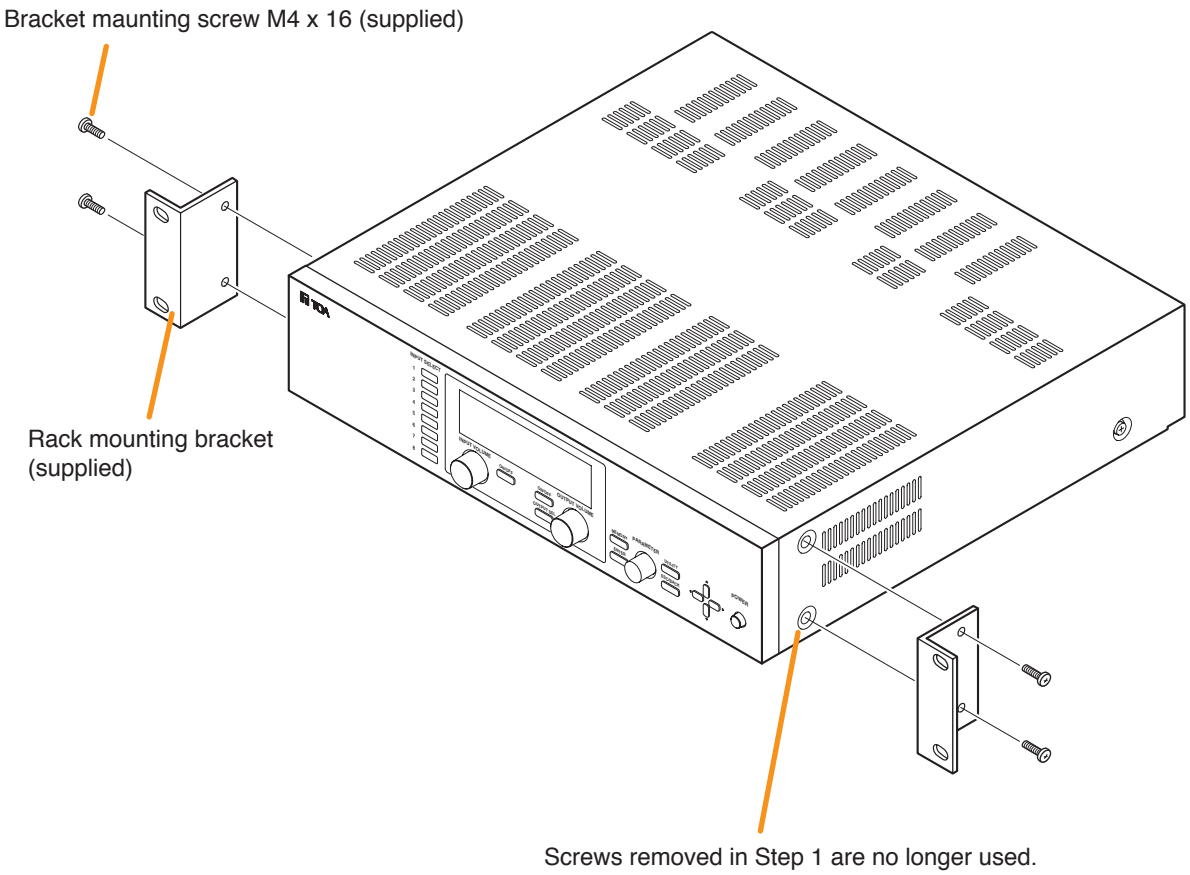


17. RACK MOUNTING BRACKET ATTACHMENT

Use the supplied rack mounting bracket when mounting the unit in an equipment rack.

Step 1. Remove four M4 x 8 screws on the sides.
The removed screws are no longer used.

Step 2. Attach the rack mounting bracket to the unit using the supplied four M4 x 16 bracket mounting screws.



Notes

- Remove 4 plastic feet on the bottom surface when mounting the unit in a rack.
- Rack mounting screws are not supplied with the unit. Use the screws that are appropriate for the rack.
- Install the unit at a well-ventilated place, and be sure to mount a 1U or more size perforated panel above and below the unit to prevent the unit's internal temperature rise.

18. AN-9001 INSTALLATION

Step 1. Install a 1-gang electrical box in a wall or ceiling.

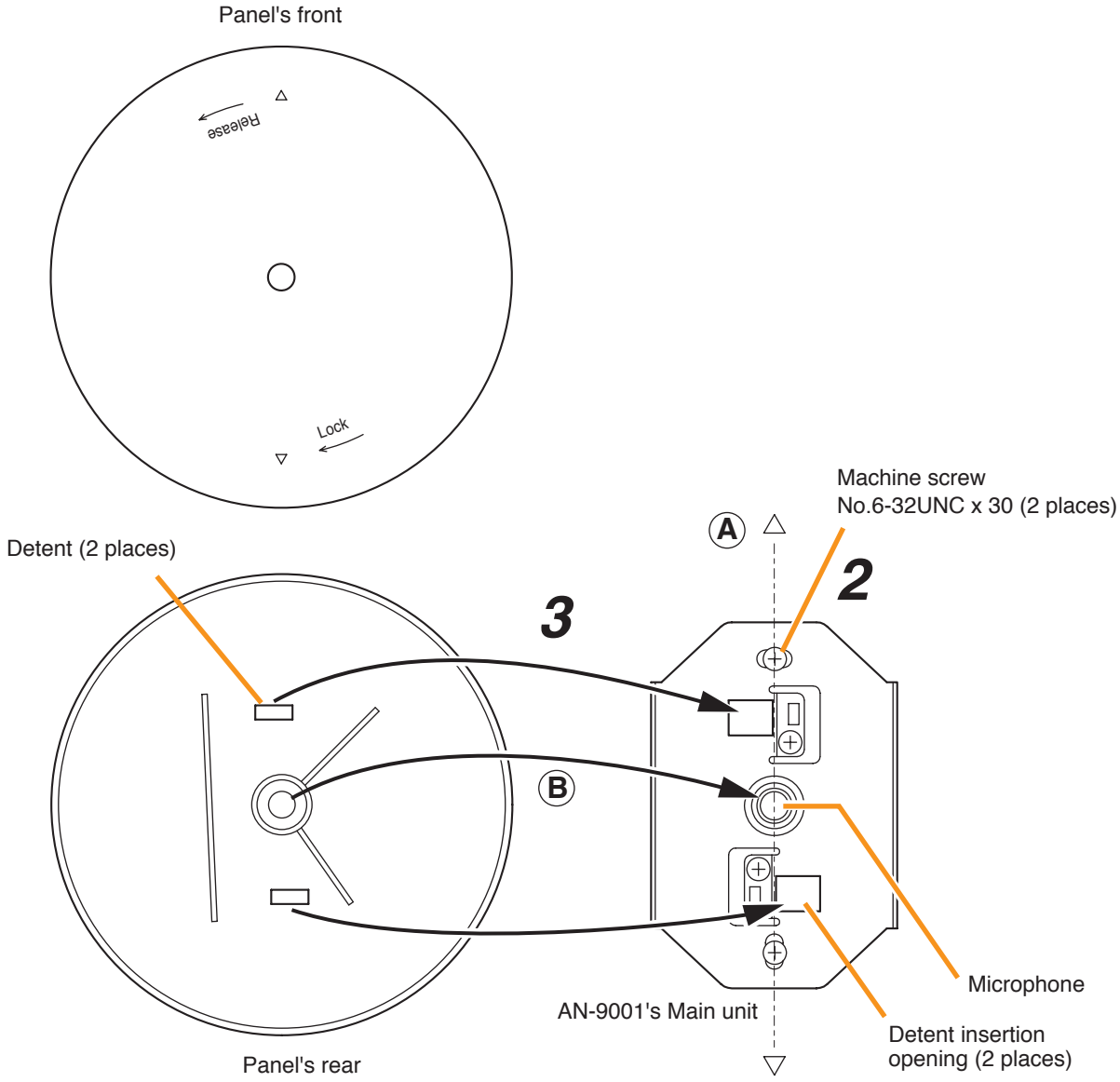
Step 2. Mount the AN-9001's Main unit to the installed electrical box.
Use the 2 screws (No.6-32UNC x 30) supplied with the AN-9001.

Note
The AN-9001 comes with 2 types of machine screws: No.6-32UNC x 30 (unified threads) and M4 x 30 (metric threads). Be sure to use correct ones.

Step 3. Let both detents on the panel's rear into the detent insertion openings of the Main unit.

Tips
For detent insertion, refer to the following points:
(A) Align 2 triangular marks on the panel with the extended line connecting between Main unit's mounting screws.
(B) Align the panel's center hole with the Main unit's microphone.

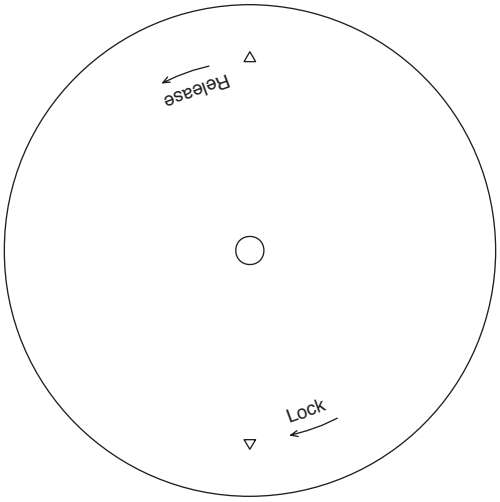
Step 4. Rotate the panel clockwise.
The panel locks into place by rotating it about 20° in the "Lock" direction.



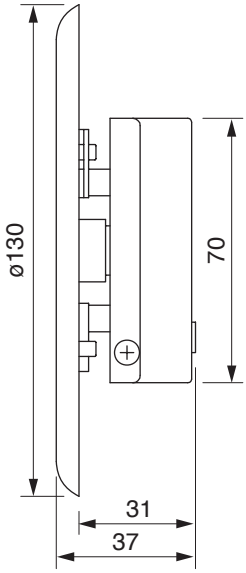
19. DIMENSIONAL DIAGRAMS

19.1. AN-9001

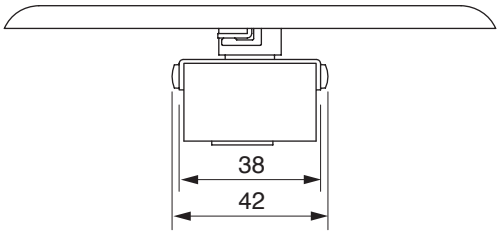
Unit: mm



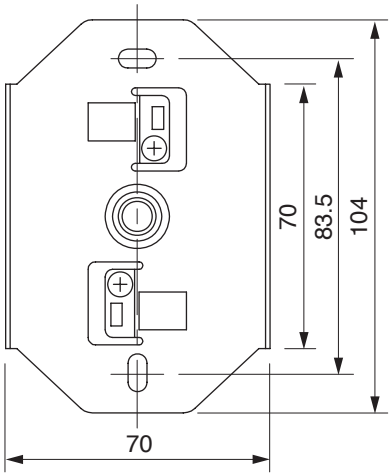
[Front]



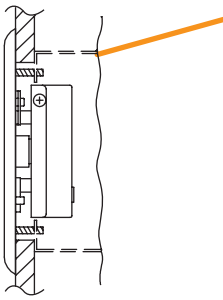
[Side]



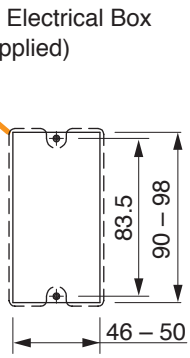
[Bottom]



[Front view of Main unit]



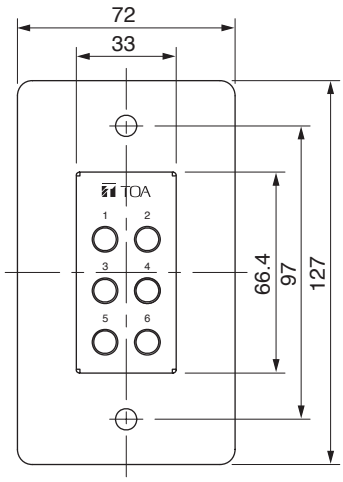
[Figure when mounted]



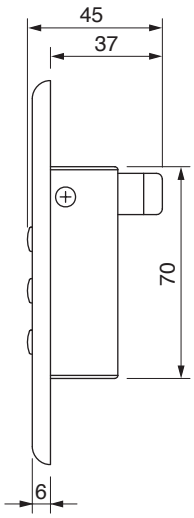
[Dimensions of mounting opening]

19.2. ZM-9001

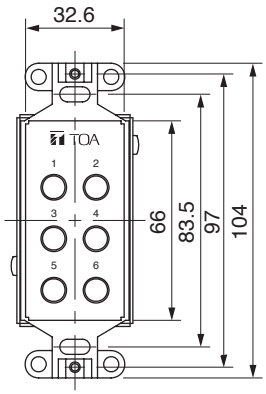
Unit: mm



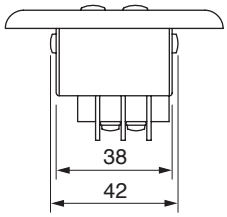
[Front]



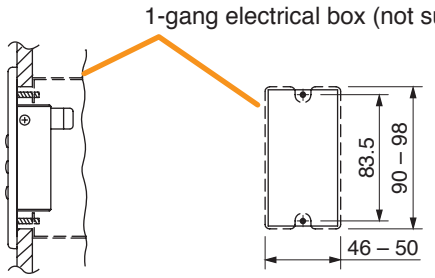
[Side]



[Front View without panel]



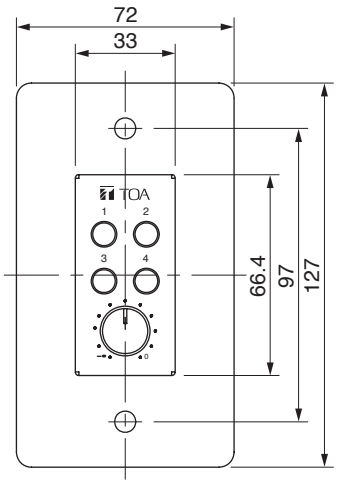
[Bottom]



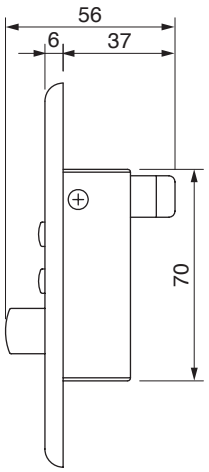
[Figure when mounted] [Dimensions of mounting opening]

19.3. ZM-9002

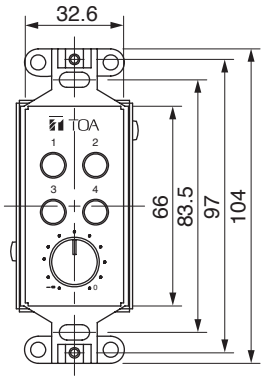
Unit: mm



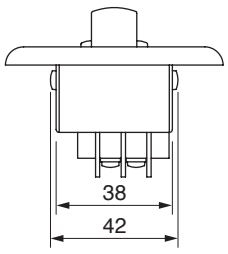
[Front]



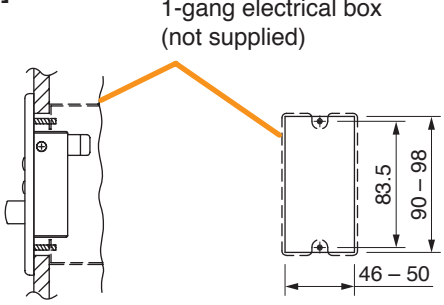
[Side]



[Front View without panel]



[Bottom]

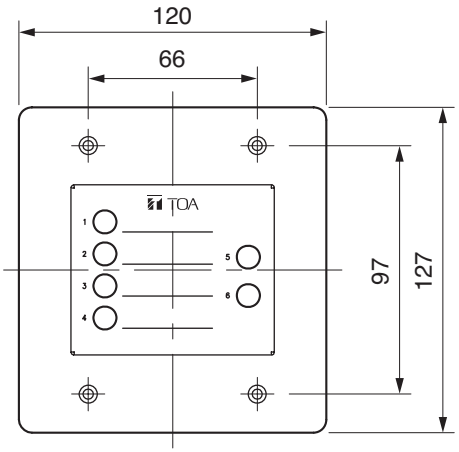


[Figure when mounted] [Dimensions of mounting opening]

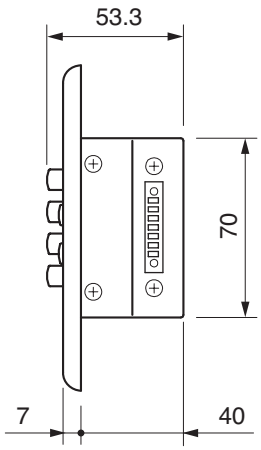
19.4. ZM-9003

Unit: mm

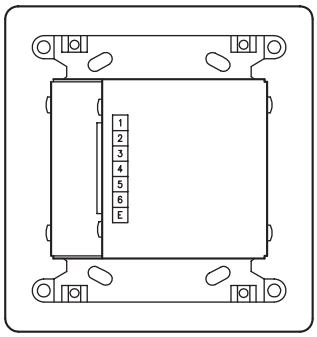
[Front]



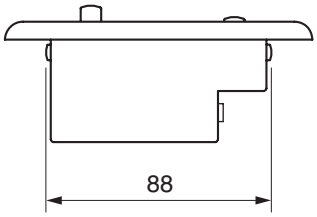
[Side]



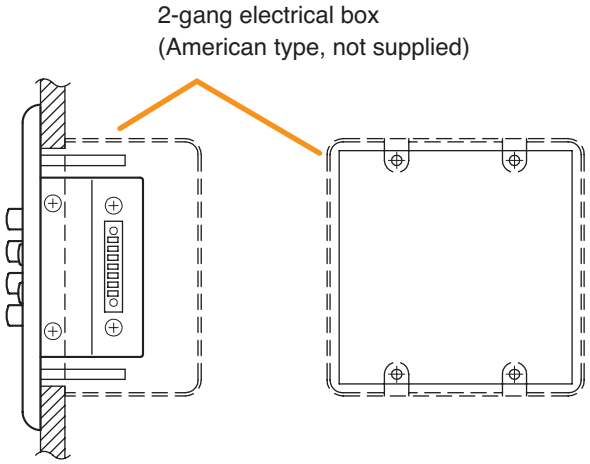
[Rear]



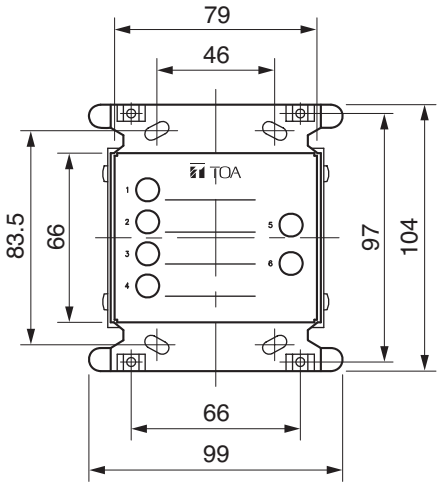
[Bottom]



[Figure when mounted]

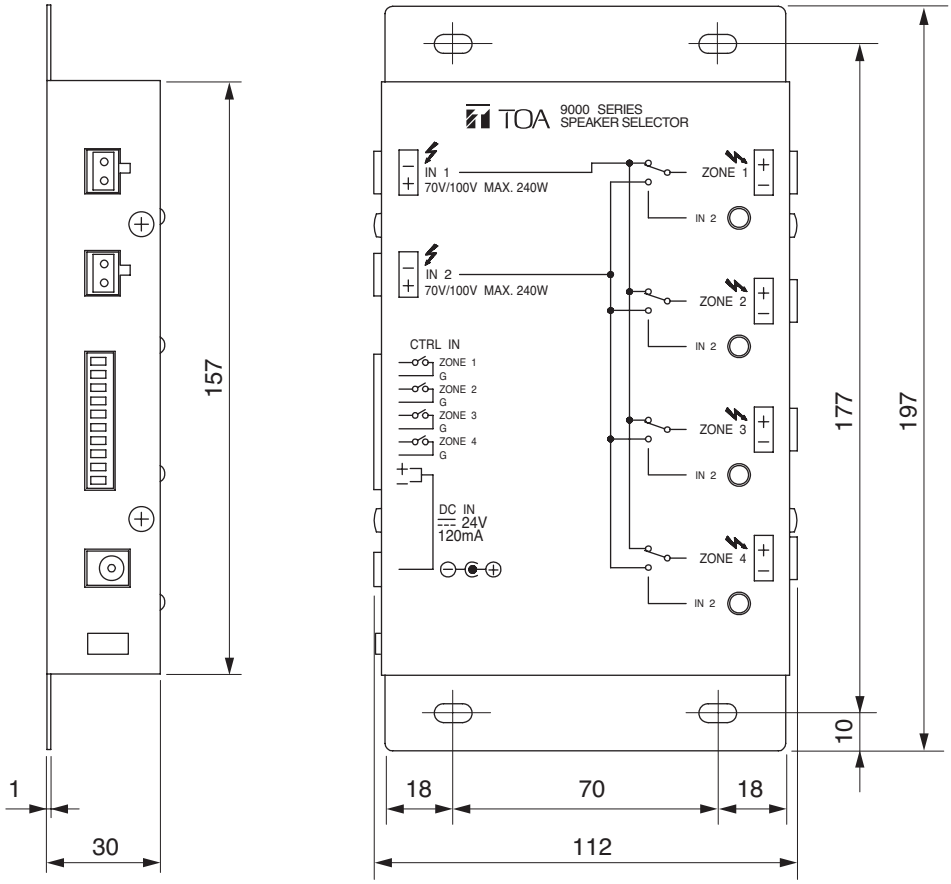


[Front view without panel]



19.5. SS-9001

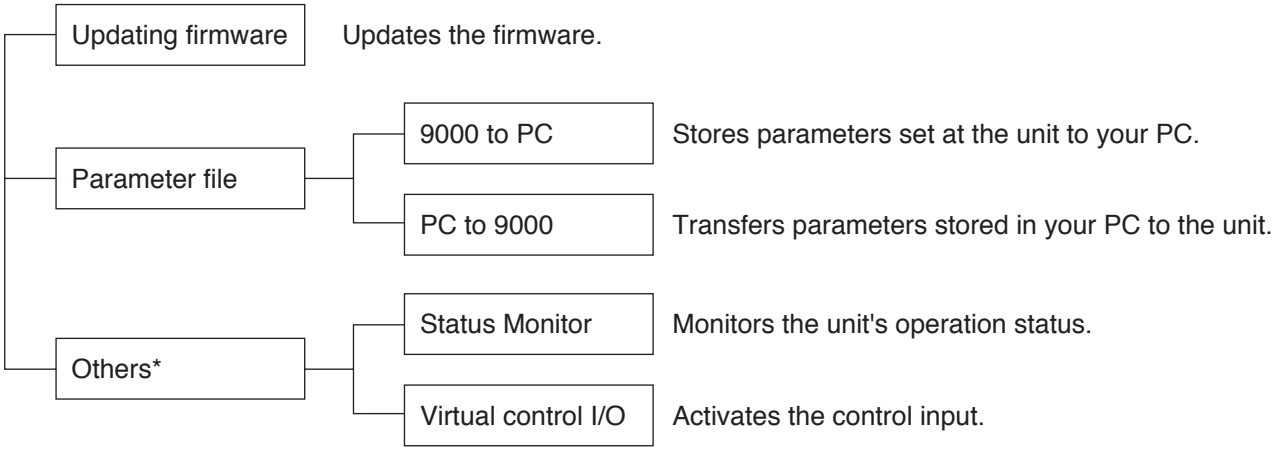
Unit: mm



20. HOW TO USE THE SUPPLIED SOFTWARE

20.1. General Description

The supplied CD-ROM contains the A-9000 series maintenance software, which executes the following utility programs.



* Used to check the unit at installation.

[System requirements]

Ensure your PC operates on Windows XP and also meets the following requirements, or this software will not run properly.

Serial port: RS-232C port or compatible with USB-to-RS232C converter
Media & Drive: CD-ROM

Note: Windows is a trademark of Microsoft Corporation.

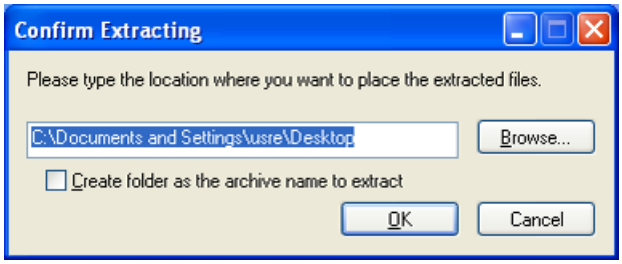
20.2. Installing the Software

Step 1. Load the supplied CD-ROM into the PC's CD-ROM drive.

Step 2. Double-click the "setup_a9k.exe" icon in the software folder.

Step 3. Designate the folder into which the 9000 series maintenance software is extracted, and click the "OK" button.

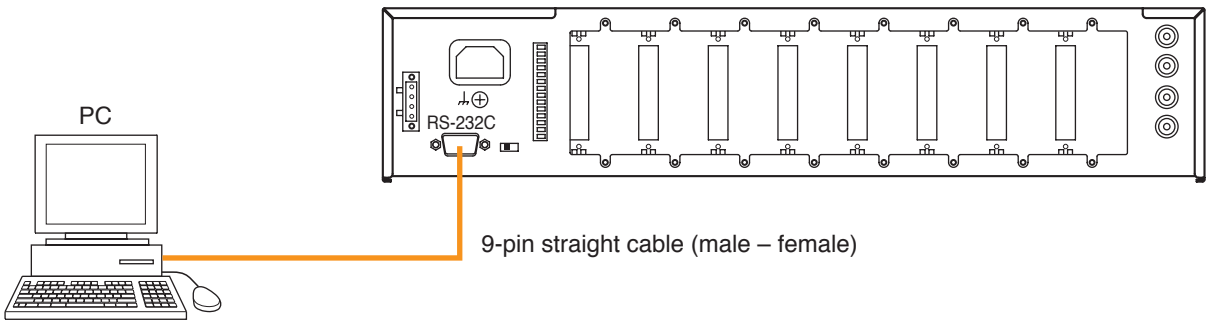
Note
After installation completion, only the software icon is created in the folder designated in the screen at right. The software execution file is moved into the automatically created C:/ProgramFiles/TOA folder after being extracted.


Confirm Extracting
Please type the location where you want to place the extracted files.
C:\Documents and Settings\usre\Desktop
Browse...
Create folder as the archive name to extract
OK
Cancel

Step 4. After installation completion, confirm the "MaintCtrl.exe" icon is created in the folder designated in Step 3.

20.3. Connecting the Unit to the PC

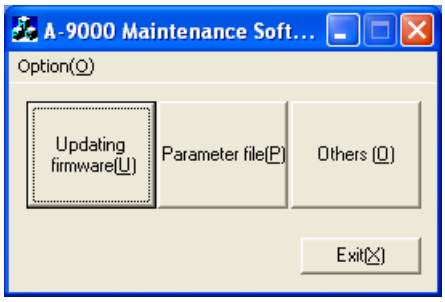
Connect the unit's RS-232C port and the PC's RS-232C port with a 9-pin straight cable (male - female).



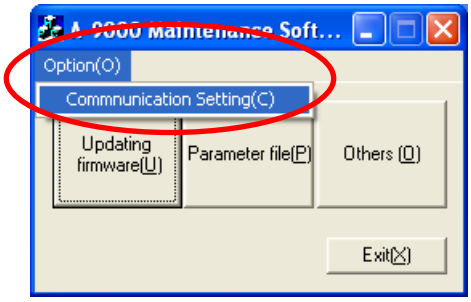
20.4. Setting the Communication Port and Speed

Set the PC's communication port and speed according to the procedure below.

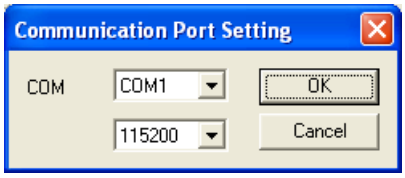
Step 1. Double-click the "MaintCtrl.exe" icon to run the 9000 series maintenance software.
The screen at right is displayed.



Step 2. Pull down the menu from the "Option" button and select "Communication Setting."



The screen at right is displayed.

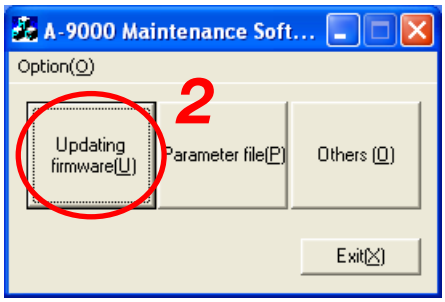


Step 3. Select the communication port and speed to match the connected PC.
Then, click the "OK" button.
The COM port is factory-preset to "COM1" and the communication speed to "57600."

20.5. Updating the Firmware

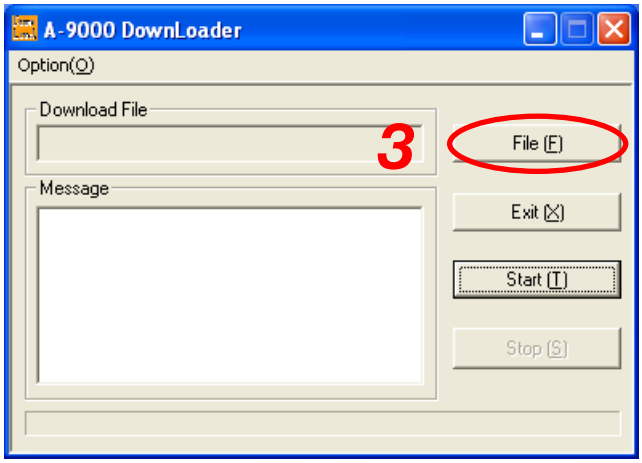
Our latest A-9000 firmware is made available on our product information download site (http://www.toa-products.com/international/). You can also obtain the latest version by downloading it.
The communication speed is fixed to a given value during updating irrespective of its setting.

Step 1. Double-click the "MaintCtrl.exe" icon to run the 9000 series maintenance software.
The screen at right is displayed.

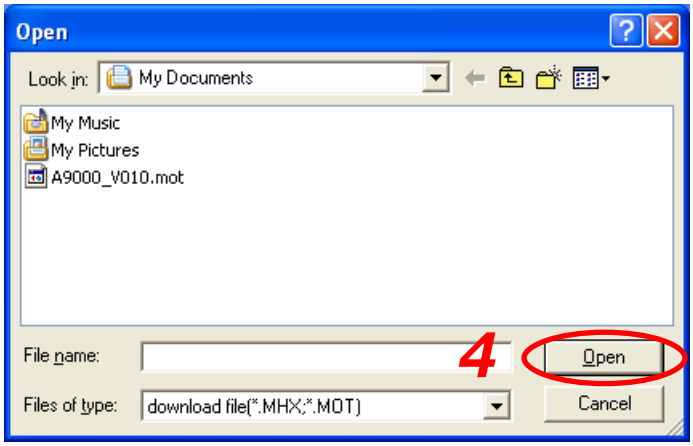


Step 2. Click the "Updating firmware" button.
The window at right opens.
The communication status is displayed in the "Message" box.

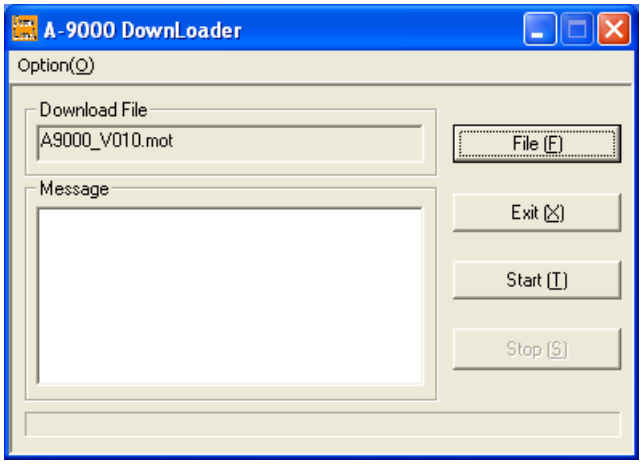
Tip
You can also set the communication port here when pressing the "Option" button on the menu bar to select "Communication Setting."



Step 3. Click the "File" button.
The window at right opens.



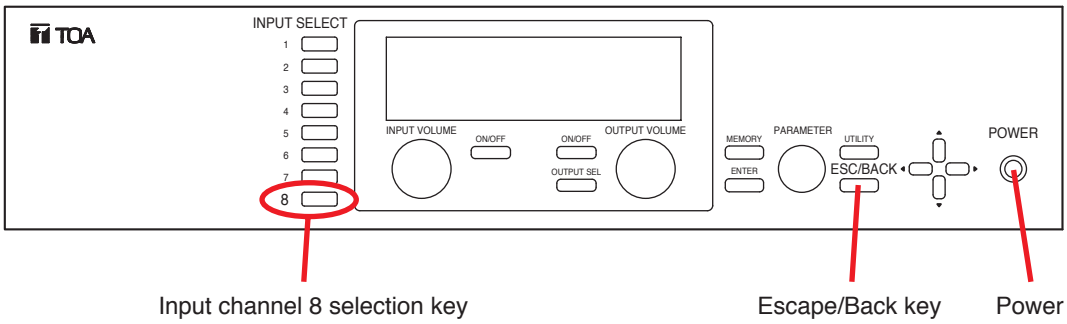
Step 4. Select the file, then click the "Open" button.
The selected download file is entered in the "Download File" box.



Step 5. Perform the following key operations at the unit to make the unit ready for data reception from the PC.

5-1. Turn the power switch off.

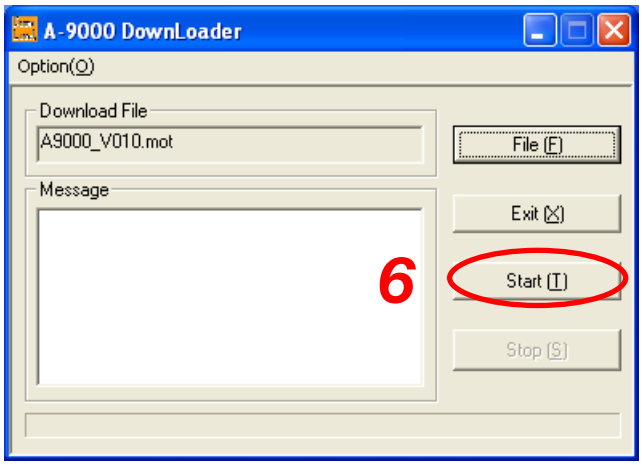
5-2. Press the Input channel 8 selection key, Escape/Back key, and Power switch at the same time.
The unit is placed in standby mode for communications with the PC.



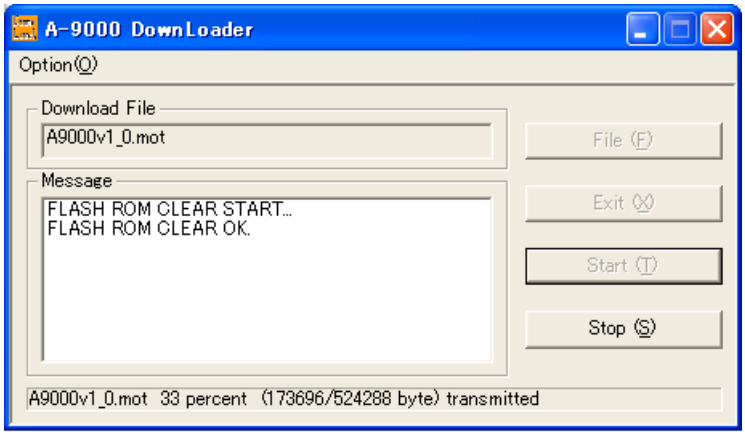
Input channel 8 selection key Escape/Back key Power switch

Step 6. Click the "Start" button to start the firmware file transfer.

Note
Never shut off either power of the amplifier or PC during transfer.
Should power fail or a communication error occur, return to Step 5.



The window at right opens.



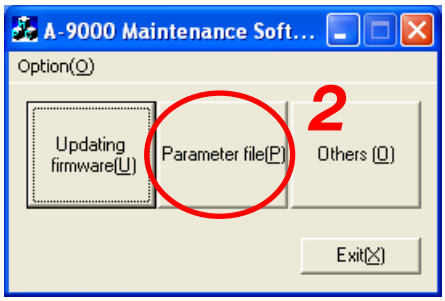
Step 7. Click the "Exit" button to terminate the program after download completion.
The screen returns to the initial menu screen in Step 1.

Note
After update completion, the communication speed is initialized to the default value.
Reset it as needed. (Refer to p. 111 "Setting the Communication Port and Speed.")

20.6. Storing or Recalling Parameters Set at the Unit

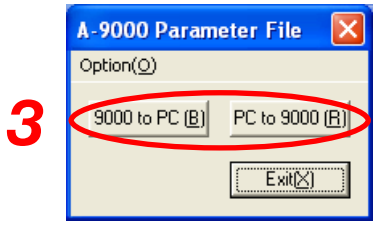
You can back up the parameters set at the unit to your PC, or transfer the parameters stored in your PC to the unit.

Step 1. Double-click the "MaintCtrl.exe" icon to run the 9000 series maintenance software.
The screen at right is displayed.

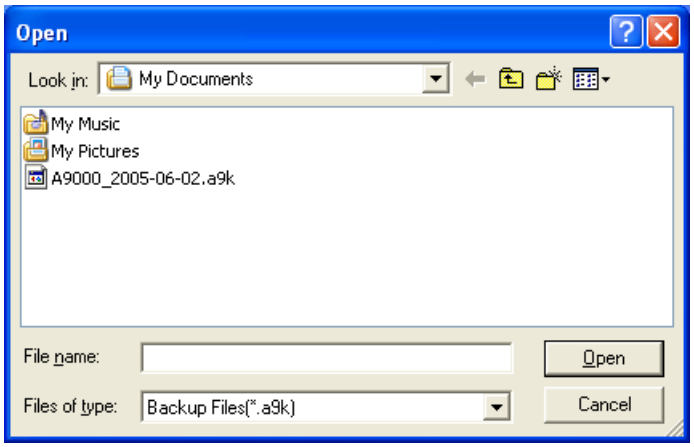


Step 2. Click the "Parameter file" button.
The window at right opens.

Tip
You can also set the communication port and speed here when pressing the "Option" button on the menu bar to select "Communication Setting."



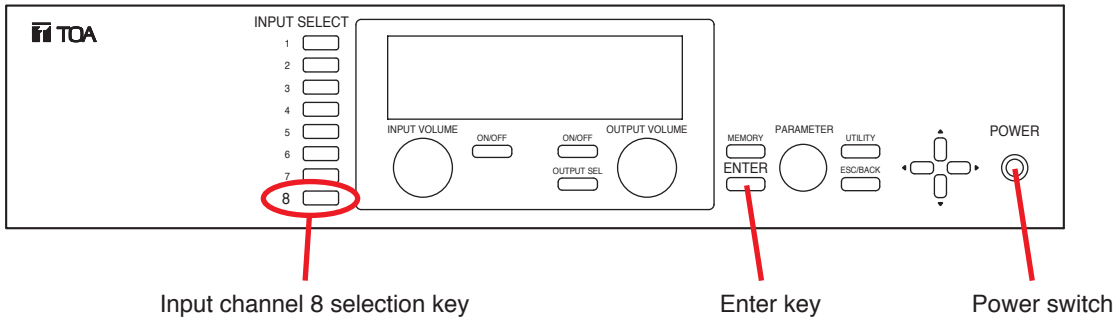
Step 3. Click the "9000 to PC" button when storing parameters set at the unit to your PC, while click the "PC to 9000" button to transfer parameters stored in your PC to the unit.
The window at right opens.



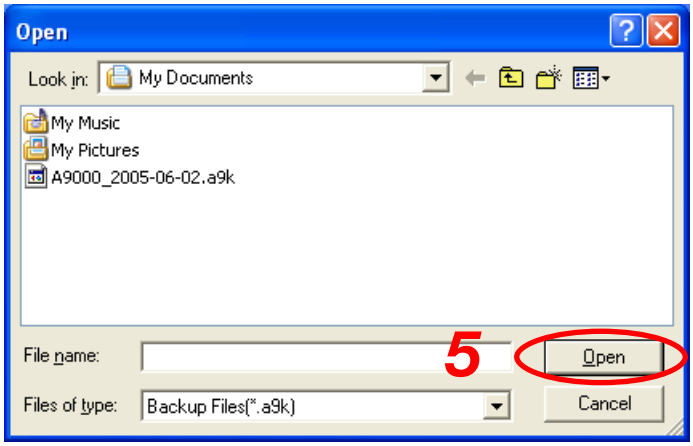
Step 4. Perform the following key operations at the unit to permit data transmission/reception between the unit and the PC.

4-1. Turn the power switch off.

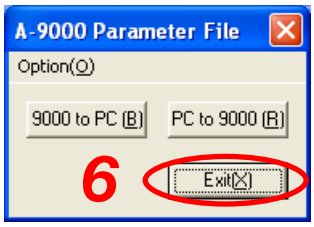
4-2. Press the Input channel 8 selection key, Enter key, and Power switch at the same time.
The unit is placed in standby mode for communications with the PC.



Step 5. Select the file, then click the "Open" button.
The set parameters are transferred from the unit to the PC or from the PC to the unit.



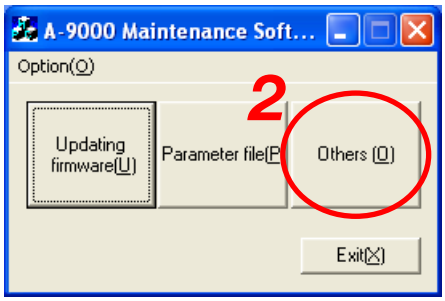
Step 6. Click the "Exit" button to terminate the program after data transmission completion.
The screen returns to the initial menu screen in Step 1.



20.7. Monitoring the Unit's Operation Status

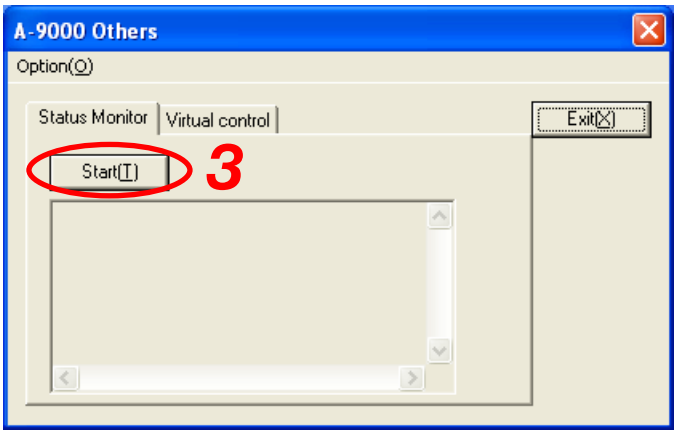
The operation status of the unit can be monitored in real time.

Step 1. Double-click the "MaintCtrl.exe" icon to run the 9000 series maintenance software.
The screen at right is displayed.

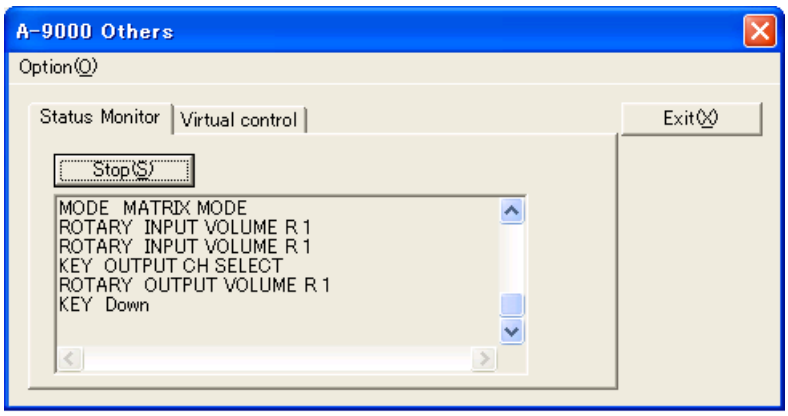


Step 2. Click the "Others" button.
The window at right opens.

Tip
You can also set the communication port and speed here when pressing the "Option" button on the menu bar to select "Communication Setting."



Step 3. Click the "Start" button.
Operation status such as the unit's key or knob actions is displayed in real time.

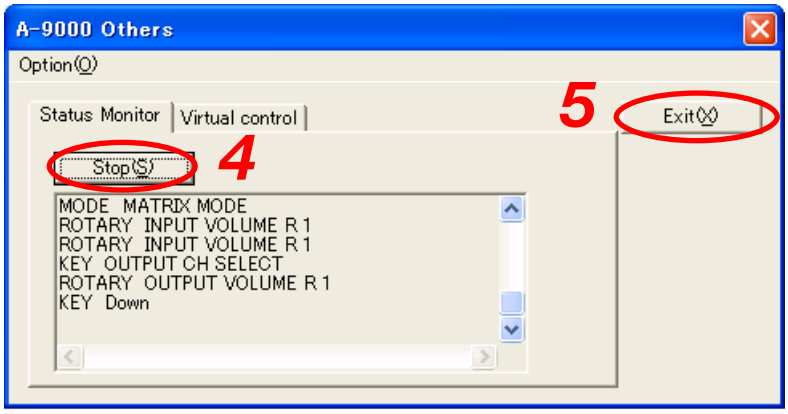


[Screen indications and their descriptions]

Indication	Description
KEY INPUT SELECT 1	INPUT SELECT 1 key has been pressed.
KEY POWER long	Power switch has been pressed long.
KEY UTILITY & ESC/BACK	UTILITY key and ESC/BACK key have been pressed at the same time.
ROTARY INPUT VOLUME L 1	INPUT VOLUME control has been turned one click counterclockwise.
CIN CONTROL INPUT 2 (ON)	Control input 2 terminal has been turned on.
MATRIX MODE	Unit is operating in matrix mode.
MIXER MODE	Unit is operating in mixer mode.
POWER ON	Power has been turned on.

Step 4. To stop monitoring, click the "Stop" button.

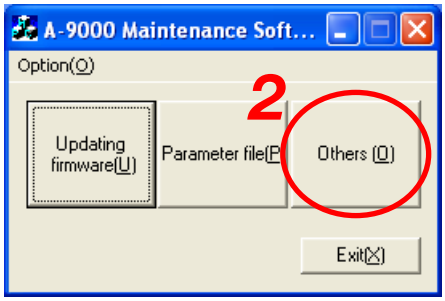
Step 5. Click the "Exit" button to terminate the program.
The screen returns to the initial menu screen in Step 1.



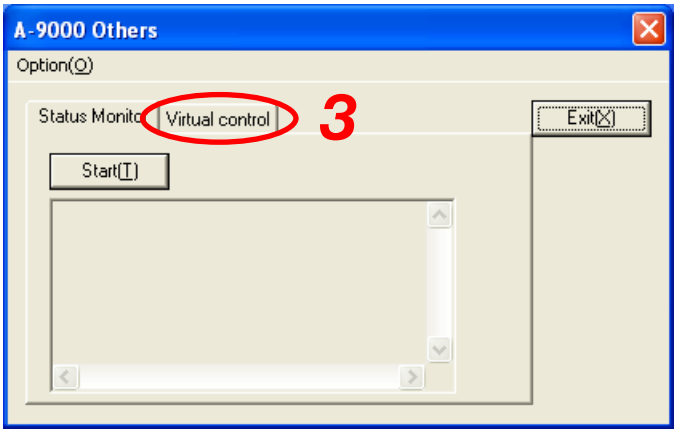
20.8. Activating the Control Input

You can simulate the unit's control input activation through PC operation.

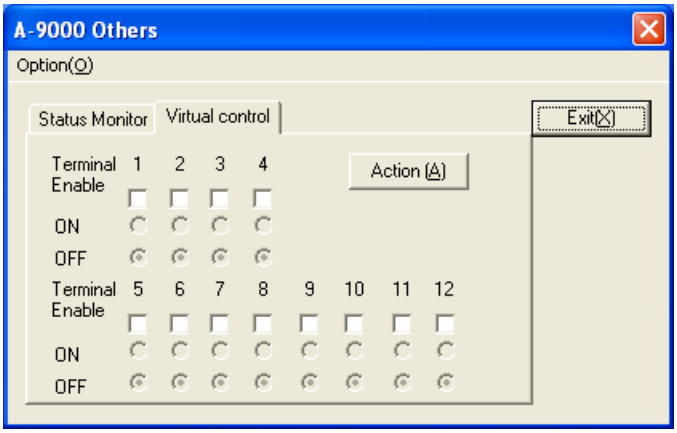
Step 1. Double-click the "MaintCtrl.exe" icon to run the 9000 series maintenance software.
The screen at right is displayed.



Step 2. Click the "Others" button.
The window at right opens.



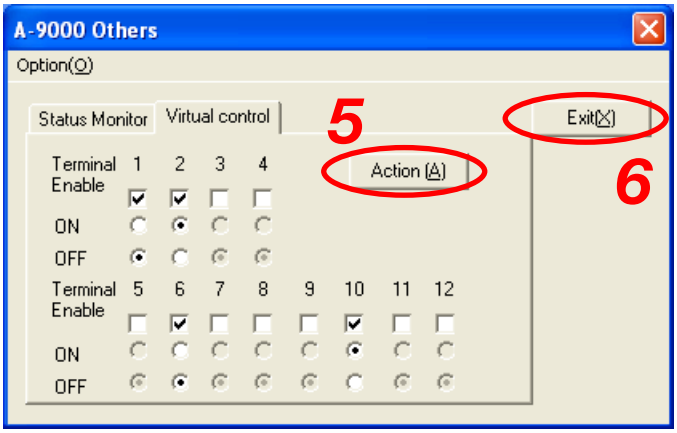
Step 3. Click the "Virtual control" tab.
The window at right opens.
Terminal 1 – 12 represent the control input terminal numbers.



Step 4. Tick the "Enable" boxes of the control inputs you want to activate, then select either ON or OFF.

Step 5. Click the "Action" button.
The Control inputs set to ON are activated.

Step 6. Click the "Exit" button to terminate the program.
The screen returns to the initial menu screen in Step 1.



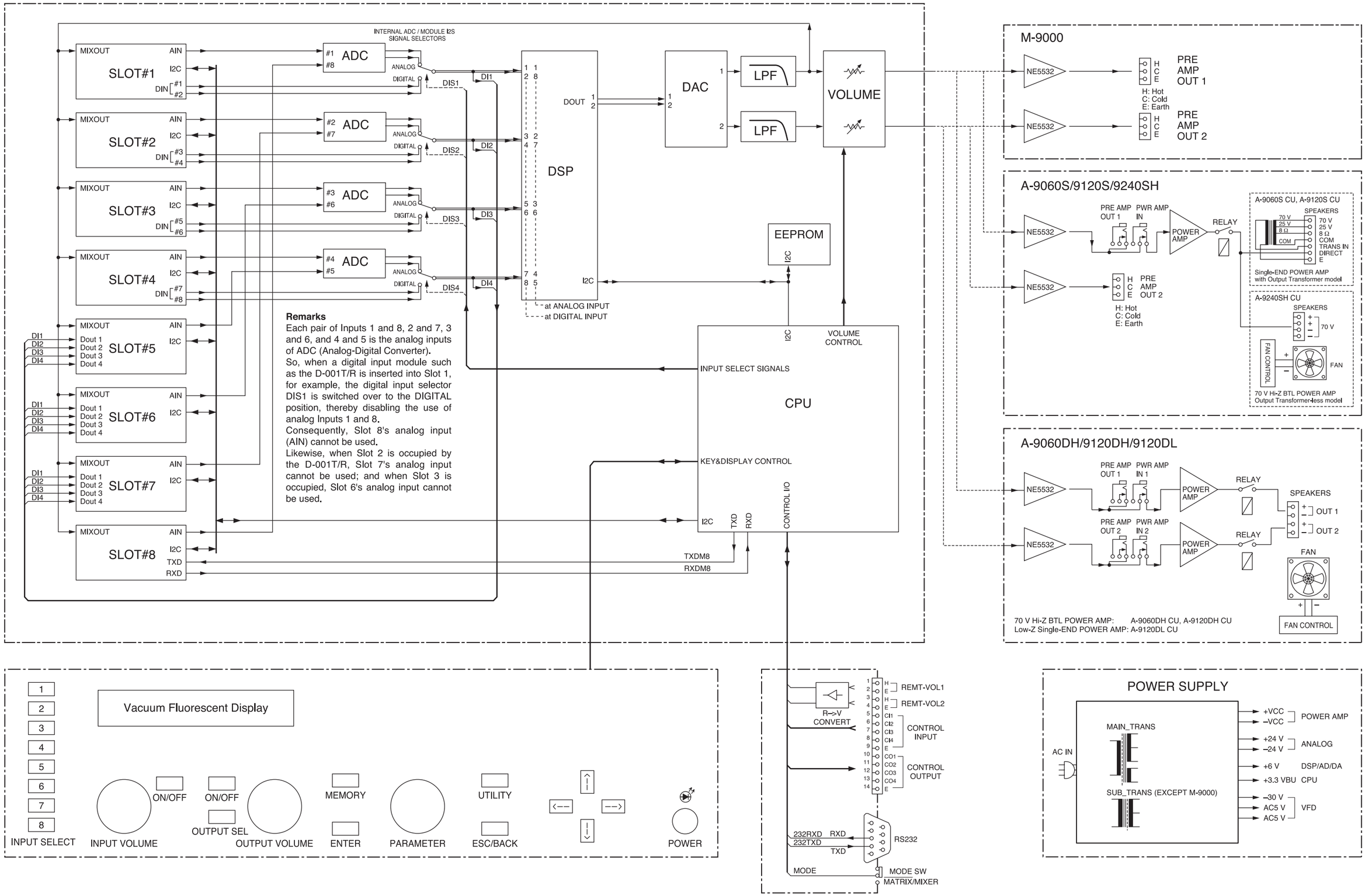
21. ERROR INDICATIONS

Error indications	Possible cause and Remedy
MODULE SLOT#No. ERROR	A module is inserted into a wrong slot. Check to confirm that each module is inserted into a correct slot, and correctly reinsert the module inserted into the wrong slot. (Refer to p. 89 "MODULE INSTALLATION.")
DC PROTECT (OUTPUT #No.)	There may be overload or excessive signal input. Check input and output signal levels and gain settings, then adjust them as necessary. If the indicator remains lit, consult your TOA dealer.
THERMAL PROTECT	The unit is heated to a high temperature. Check that the unit is properly installed. (Refer to p. 11 "INSTALLATION PRECAUTIONS.") Disconnect the AC cord from the unit, and allow the unit to cool for a while. The unit automatically resumes operation when its inner temperature decreases. If this happens frequently, contact your TOA dealer.
ERASE MIXER MEMO?	The unit's Mode switch was shifted from the Mixer mode to the Matrix mode while the AC power supply was shut off. Press the Enter key to erase the data set in the Mixer mode inside the unit.
ERASE MATRIX MEMO?	The unit's Mode switch was shifted from the Matrix mode to the Mixer mode while the AC power supply was shut off. Press the Enter key to erase the data set in the Matrix mode inside the unit.
INITIALIZE MEMORY?	Module-to-Slot configuration was changed or a module was damaged. Perform any of the following operations: (1) Press the Enter key. The set parameter in question is reset to the default setting. (2) Press the Memory key. The unit continues to start up. After start-up is competed, back up the set parameters using the supplied software, then confirm the setting in question to correct. (3) Press the Escape/Back key. "MODULE SLOT#No. ERROR" appears indicating the error slot. Reinsert the correct module into the slot.
The Fault indicator lights.	A communication error between the unit and module occurred. Disconnect the AC power supply, then reconnect it. If the indicator remains lit, this may indicate a unit failure. Consult your TOA dealer.
The Fault indicator flashes.	A setting error occurs and a part of or entire data are initialized. Reconfirm the set data.

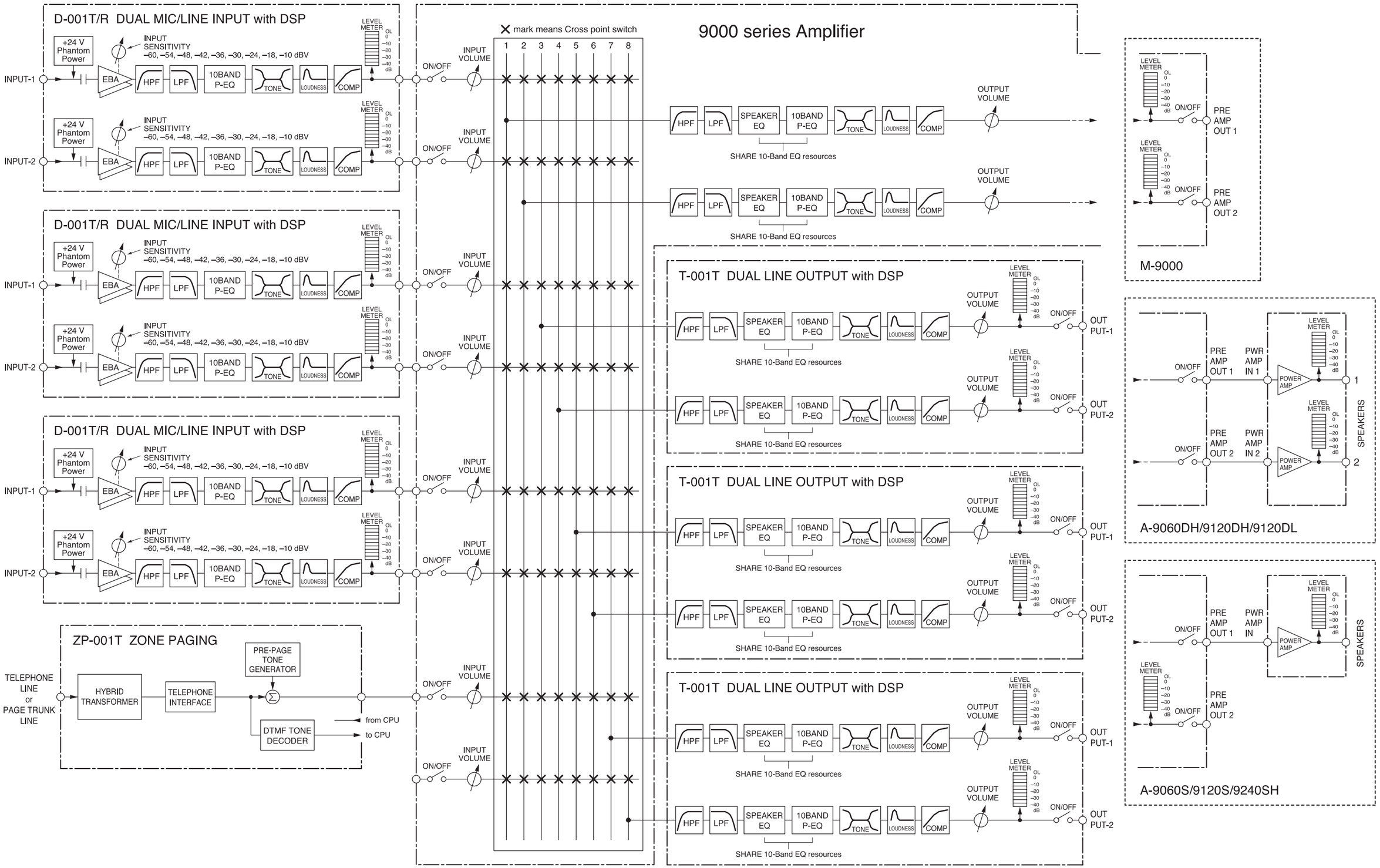
22. TROUBLESHOOTING

Symptom	Possible Cause	Remedy
Noise generated.	Module mounting screw not securely tightened.	If this screw is loose, noise may be produced. Ensure that the screw is tightened.
Excessive noise.	Incorrect module input sensitivity setting.	The unit is designed to digitize audio signals with an AD converter and vary the input level with a digital volume control. Therefore, noise increases if the input or output volume control is set to a level higher than 0 dB while the AD converter input is kept low.
Sound distorted.	Incorrect module input sensitivity setting.	The unit is designed to digitize audio signals with an AD converter and vary the input level with a digital volume control. Therefore, when an extremely large input is fed into the AD converter, the voice remains distorted even if the volume is decreased.
Phantom power not supplied.	D-001T module mounting screw not securely tightened. (D-001R cannot supply phantom power irrespective of its ON/OFF setting.)	If this screw is loose, phantom power is not supplied. Ensure that the module mounting screw is tightened.
	Phantom power set to OFF in D-001T module input setting. (D-001R cannot supply phantom power irrespective of its ON/OFF setting.)	If phantom power is set to OFF in D-001T module input setting, phantom power is not supplied. Set phantom power to ON in the setting.
Condenser microphone does not operate correctly.	Condenser microphone of the type powered by over +24 V is used.	The D-001T module's phantom power supplies +24 V. If using a condenser microphone powered by over +24 V, separately prepare phantom power supply equipment recommended by the equipment manufacturer.
Amplifier malfunctioned (does not operated as intended.)	Incorrect item or parameter setting.	Check the related setting items and set contents.

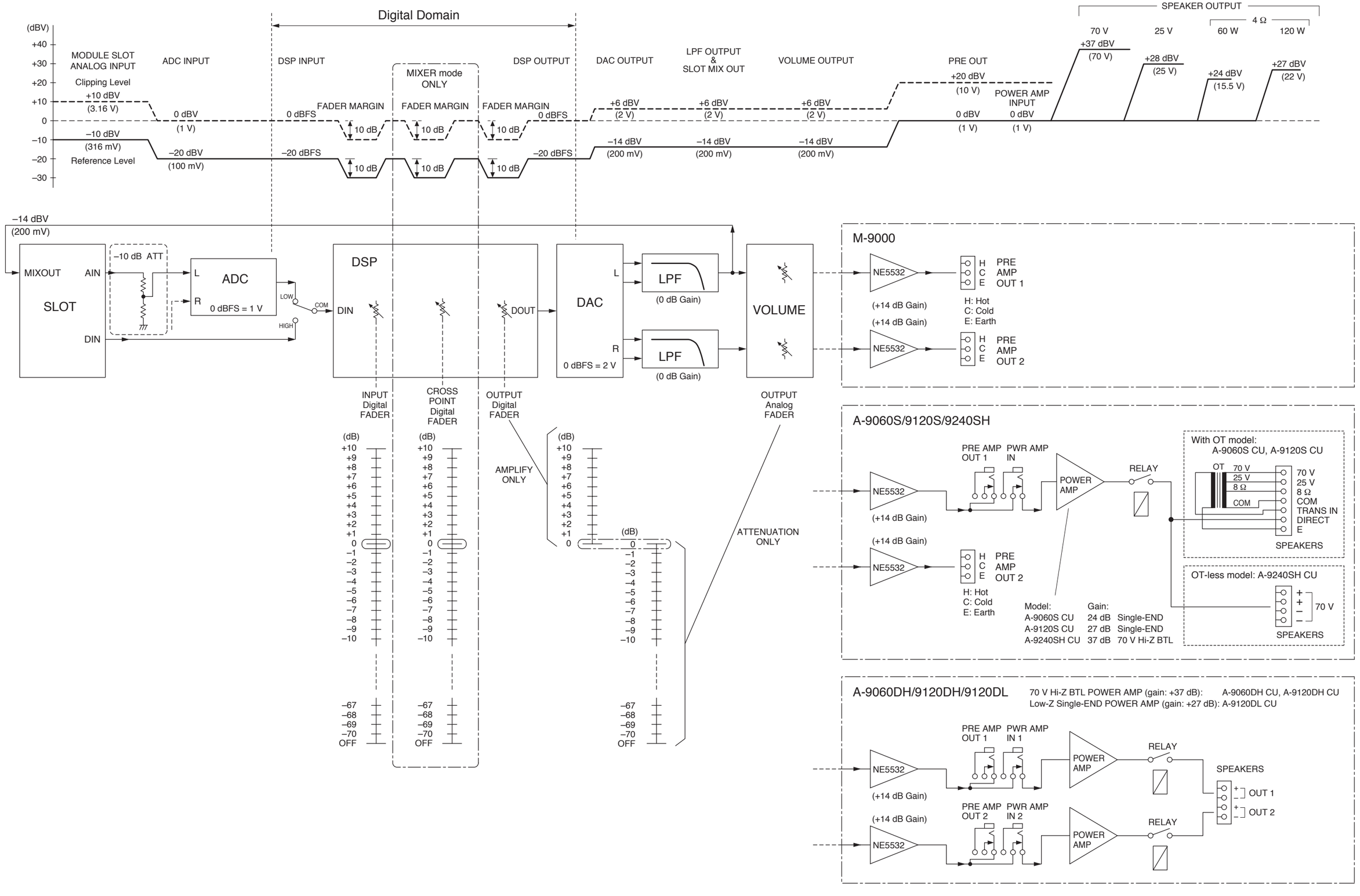
23. BLOCK DIAGRAM



24. SIGNAL FLOW DIAGRAM

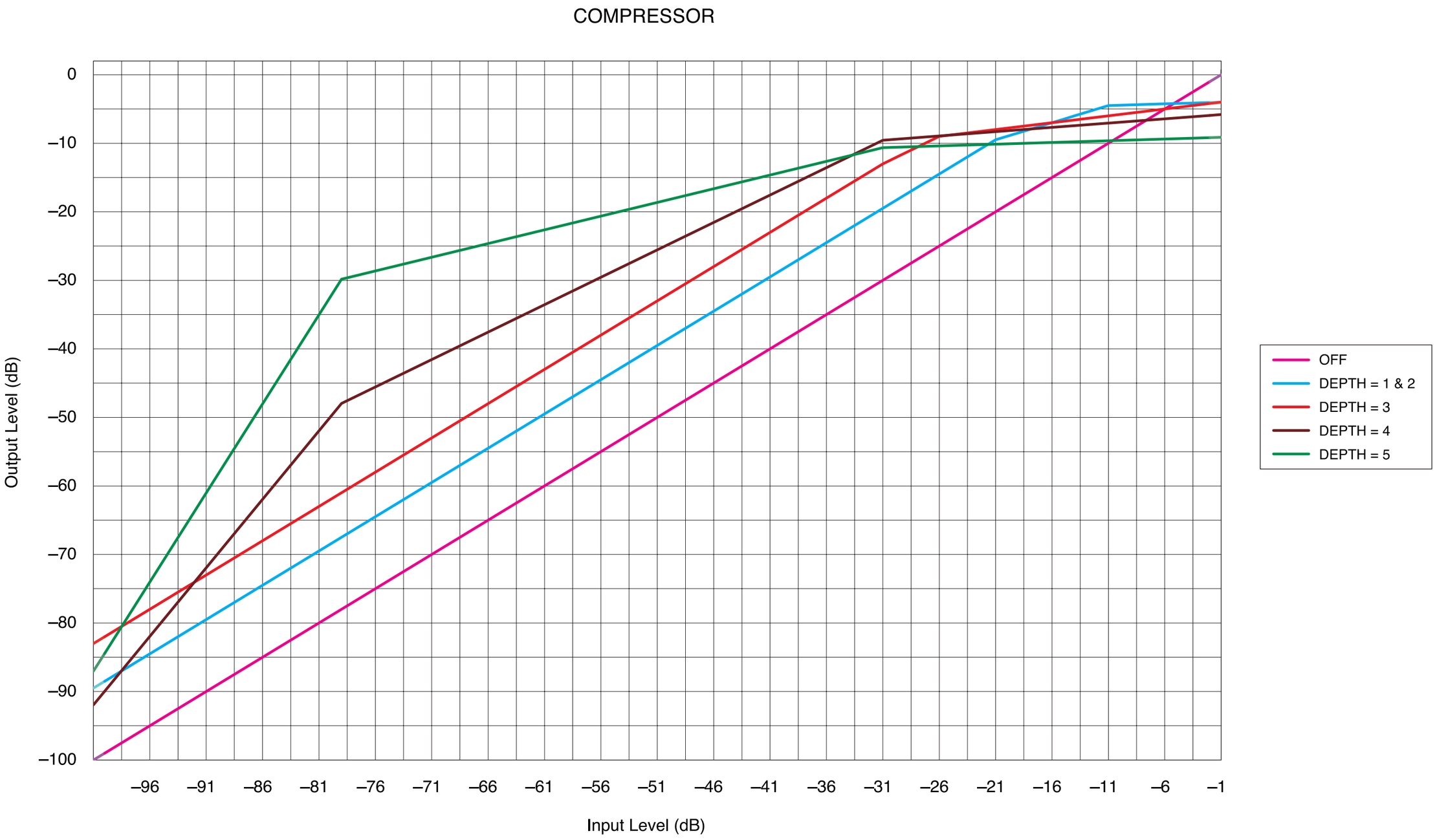


25. LEVEL DIAGRAM



26. COMPRESSION CHARACTERISTICS DIAGRAM

The diagram below shows the compression characteristics on p. 71-D8.



27. SPECIFICATIONS

27.1. M-9000

Power Source	120 V AC, 60 Hz
Power Consumption	40 W
Audio Input	Max. 8 channels, modular construction (modules optional)
Audio Output	Preamplifier output 1, 2: 0 dB*1, 600 Ω, balanced, removable terminal block (3 pins)
Module Slot	Analog input (slot 1 – 8): –10 dB*1, 10 kΩ, unbalanced Digital input (slot 1 – 4): 24 bit/48 kHz MIX output (slot 1 – 8): –14 dB*1, 330 Ω (CH1 prefader output), unbalanced Digital output (slot 5 – 7): 24 bit/48 kHz Power supply (slot 1 – 8): +24 V, –24 V, +6 V DC
Digital Audio Signal Reference Level	–20 dB FS
Frequency Response	20 – 20,000 Hz, +1, -3 dB
Total Harmonic Distortion	0.008% (at 22 kHz LPF, 1 kHz, +10 dB*1 output)
S/N Ratio	At Input short, 20 – 20,000 Hz, ALL FLAT or OFF setting Output volume min.: 90 dB Output volume max.: 61 dB (input 1 volume: 0 dB, other inputs: OFF)
Cross Talk	Over 64 dB (at 20 kHz)
Tone Control	Bass: ±12 dB (at 100 Hz), Treble: ±12 dB (at 10 kHz)
Parametric Equalizer	10 bands, Frequency: 20 – 20,000 Hz, 31 steps, Variable range: ±12 dB, Q: 0.3 – 5
Speaker Equalizer	15 (compatible with TOA speakers only)
High-pass Filter	–12 dB/oct, Variable frequency range: 20 – 400 Hz, 14 steps
Low-pass Filter	–12 dB/oct, Variable frequency range: 4,000 – 20,000 Hz, 8 steps
Compressor	Depth: 1 – 5
Delay	0 – 40 ms (1 ms steps), maximum 40 ms (CH1 + CH2), mixer mode only
Scene/Event Memory	32
Operation Mode	Matrix mode/Mixer mode (selector switch)
Auxiliary Function	Key lock function
Control Input/Output	RS-232C*2, D-sub connector (9P, female) Control input: 4 inputs, no-voltage make contact input, open voltage: 3.3 V DC, short-circuit current: under 1 mA, removable terminal block (14 pins) Control output: 4 outputs, open collector output, withstand voltage: 27 V DC, control current: 50 mA, removable terminal block (14 pins) Remote volume: 2 channels, connect a 10 kΩ/linear taper variable resister or input the DC voltage of 0 to +10 V, removable terminal block (14 pins)
Operating Temperature	–10 to +40°C
Operating Humidity	35% to 80% RH (no condensation)
Finish	Panel: Aluminum, hair-line, black Case: Surface-treated steel plate, black, paint
Dimensions	420 (w) x 107.6 (h) x 353 (d) mm
Weight	6 kg

*1 0 dB = 1 V

*2 Allowing it to be controlled by a control system such as AMX and Crestron through RS-232C port.

Notes

- The design and specifications are subject to change without notice for improvement.
- AMX is a trademark of AMX Corporation.
- Crestron is a trademark of Crestron Electronics, Inc.

• **Accessories**

Power cord (2 m) 1
Rack mounting bracket 2
Bracket mounting screw (M4 x 16) 4
Blank panel 7
Blank panel mounting screw (M3 x 8) 14
Removable terminal plug (3 pins) 2
Removable terminal plug (14 pins) 1
CD-ROM 1
Start guide 1

27.2. A-9060DH, A-9120DH

Model No.	A-9060DH	A-9120DH
Power Source	120 V AC, 60 Hz	
Power Consumption	150 W	250 W
Audio Input	Max. 8 channels, modular construction (modules optional) Power amplifier input 1, 2: 0 dB*1, 10 kΩ, RCA pin jack	
Audio Output		
Preamplifier Output 1, 2	0 dB*1, 300 Ω, unbalanced, RCA pin jack	
Speaker Output 1, 2	60 W, 83 Ω x 2, BTL output, removable terminal block (4 pins)	120 W, 41 Ω x 2, BTL output, removable terminal block (4 pins)
Module Slot	Analog input (slot 1 – 8): –10 dB*1, 10 kΩ, unbalanced Digital input (slot 1 – 4): 24 bit/48 kHz MIX output (slot 1 – 8): –14 dB*1, 330 Ω (CH1 prefader output), unbalanced Digital output (slot 5 – 7): 24 bit/48 kHz Power supply (slot 1 – 8): +24 V, –24 V, +6 V DC	
Digital Audio Signal Reference Level	–20 dB FS	
Power Bandwidth	20 – 20,000 Hz, 0.008% THD	
Frequency Response	Power amplifier section: 20 – 20,000 Hz, +0, –1 dB Analog input module to speaker output: 20 – 20,000 Hz, +1, –3 dB	
Total Harmonic Distortion	Power amplifier section: 0.0008% (22 kHz LPF, 1 kHz, rated power) Analog input module to speaker output: 0.008% (22 kHz LPF, 1 kHz, rated power)	
S/N Ratio	At Input short, 20 – 20,000 Hz, ALL FLAT or OFF setting Output volume min.: 90 dB (preamplifier output) Output volume max.: 61 dB (preamplifier output, input 1 volume: 0 dB, other inputs: OFF) Power amplifier section: 110 dB	
Cross Talk	Over 64 dB (at 20 kHz)	
Tone Control	Bass: ±12 dB (at 100 Hz) Treble: ±12 dB (at 10 kHz)	
Parametric Equalizer	10 bands, Frequency: 20 – 20,000 Hz, 31 steps, Variable range: ±12 dB, Q: 0.3 – 5	
Speaker Equalizer	15 (compatible with TOA speakers only)	
High-pass Filter	–12 dB/oct, Variable frequency range: 20 – 400 Hz, 14 steps	
Low-pass Filter	–12 dB/oct, Variable frequency range: 4,000 – 20,000 Hz, 8 steps	
Compressor	Depth: 1 – 5	
Delay	0 – 40 ms (1 ms steps), maximum 40 ms (CH1 + CH2), mixer mode only	
Scene/Event Memory	32	
Operation Mode	Matrix mode/Mixer mode (selector switch)	
Auxiliary Function	Key lock function	
Control Input/Output	RS-232C*2, D-sub connector (9P, female) Control input: 4 inputs, no-voltage make contact input, open voltage: 3.3 V DC, short-circuit current: under 1 mA, removable terminal block (14 pins) Control output: 4 outputs, open collector output, withstand voltage: 27 V DC, control current: 50 mA, removable terminal block (14 pins) Remote volume: 2 channels, connect a 10 kΩ/linear taper variable resister or input the DC voltage of 0 to +10 V, removable terminal block (14 pins)	
Operating Temperature	–10 to +40°C	
Operating Humidity	35% to 80% RH (no condensation)	
Finish	Panel: Aluminum, hair-line, black Case: Surface-treated steel plate, black, paint	
Dimensions	420 (w) x 107.6 (h) x 395 (d) mm	
Weight	9 kg	11 kg

*1 0 dB = 1 V
*2 Allowing it to be controlled by a control system such as AMX and Crestron through RS-232C port.

Notes
- The design and specifications are subject to change without notice for improvement.
- AMX is a trademark of AMX Corporation.
- Crestron is a trademark of Crestron Electronics, Inc.

- **Accessories**

Power cord (2 m) 1
Rack mounting bracket 2
Bracket mounting screw (M4 x 16) 4
Blank panel 7
Blank panel mounting screw (M3 x 8) 14
Removable terminal plug (4 pins) 1
Removable terminal plug (14 pins) 1
CD-ROM 1
Start guide 1

27.3. A-9120DL

Power Source	120 V AC, 60 Hz
Power Consumption	260 W
Audio Input	Max. 8 channels, modular construction (modules optional) Power amplifier input 1, 2: 0 dB*1, 10 kΩ, RCA pin jack
Audio Output	Preamplifier output 1, 2: 0 dB*1, 300 Ω, unbalanced, RCA pin jack Speaker output 1, 2: 4 – 16 Ω, unbalanced, removable terminal block (4 pins), 120 W x 2 (4 Ω load), 70 W x 2 (8 Ω load), 40 W x 2 (16 Ω load)
Module Slot	Analog input (slot 1 – 8): –10 dB*1, 10 kΩ, unbalanced Digital input (slot 1 – 4): 24 bit/48 kHz MIX output (slot 1 – 8): –14 dB*1, 330 Ω (CH1 prefader output), unbalanced Digital output (slot 5 – 7): 24 bit/48 kHz Power supply (slot 1 – 8): +24 V, –24 V, +6 V DC
Digital Audio Signal Reference Level	–20 dB FS
Power Bandwidth	20 – 20,000 Hz, 0.02% THD
Frequency Response	Power amplifier section: 20 – 20,000 Hz, +0, –1 dB Analog input module to speaker output: 20 – 20,000 Hz, +1, –3 dB
Total Harmonic Distortion	Power amplifier section: 0.0008% (8 Ω, 16 Ω rated power) 0.002% (4 Ω rated power) Analog input module to speaker output: 0.008% (22 kHz LPF, 1 kHz, rated power)
S/N Ratio	At Input short, 20 – 20,000 Hz, ALL FLAT or OFF setting Output volume min.: 90 dB (preamplifier output) Output volume max.: 61 dB (preamplifier output, input 1 volume: 0 dB, other inputs: OFF) Power amplifier section: 110 dB
Cross Talk	Over 64 dB (at 20 kHz)
Tone Control	Bass: ±12 dB (at 100 Hz), Treble: ±12 dB (at 10 kHz)
Parametric Equalizer	10 bands, Frequency: 20 – 20,000 Hz, 31 steps, Variable range: ±12 dB, Q: 0.3 – 5
Speaker Equalizer	15 (compatible with TOA speakers only)
High-pass Filter	–12 dB/oct, Variable frequency range: 20 – 400 Hz, 14 steps
Low-pass Filter	–12 dB/oct, Variable frequency range: 4,000 – 20,000 Hz, 8 steps
Compressor	Depth: 1 – 5
Delay	0 – 40 ms (1 ms steps), maximum 40 ms (CH1 + CH2), mixer mode only
Scene/Event Memory	32
Operation Mode	Matrix mode/Mixer mode (selector switch)
Auxiliary Function	Key lock function
Control Input/Output	RS-232C*2, D-sub connector (9P, female) Control input: 4 inputs, no-voltage make contact input, open voltage: 3.3 V DC, short-circuit current: under 1 mA, removable terminal block (14 pins) Control output: 4 outputs, open collector output, withstand voltage: 27 V DC, control current: 50 mA, removable terminal block (14 pins) Remote volume: 2 channels, connect a 10 kΩ/linear taper variable resister or input the DC voltage of 0 to +10 V, removable terminal block (14 pins)
Operating Temperature	–10 to +40°C
Operating Humidity	35% to 80% RH (no condensation)
Finish	Panel: Aluminum, hair-line, black Case: Surface-treated steel plate, black, paint
Dimensions	420 (w) x 107.6 (h) x 395 (d) mm
Weight	11 kg

*1 0 dB = 1 V
*2 Allowing it to be controlled by a control system such as AMX and Crestron through RS-232C port.

Notes
- The design and specifications are subject to change without notice for improvement.
- AMX is a trademark of AMX Corporation.
- Crestron is a trademark of Crestron Electronics, Inc.

- **Accessories**

Power cord (2 m) 1
Rack mounting bracket 2
Bracket mounting screw (M4 x 16) 4
Blank panel 7
Blank panel mounting screw (M3 x 8) 14
Removable terminal plug (4 pins) 1
Removable terminal plug (14 pins) 1
CD-ROM 1
Start guide 1

27.4. A-9060S, A-9120S

Model No.	A-9060S	A-9120S
Power Source	120 V AC, 60 Hz	
Power Consumption	100 W	150 W
Audio Input	Max. 8 channels, modular construction (modules optional) Power amplifier input: 0 dB*1, 10 kΩ, RCA pin jack	
Audio Output		
Preamplifier Output 1	0 dB*1, 300 Ω, unbalanced, RCA pin jack	
Preamplifier Output 2	0 dB*1, 600 Ω, balanced, removable terminal block (3 pins)	
Speaker Output	[Direct] 60 W, 4 Ω, unbalanced, removable terminal block (7 pins)	[Direct] 120 W, 4 Ω, unbalanced, removable terminal block (7 pins)
	[Transformer] 60 W, 8 Ω 25 V & 75 V, balanced, removable terminal block (7 pins)	[Transformer] 120 W, 8 Ω 25 V & 75 V, balanced, removable terminal block (7 pins)
Module Slot	Analog input (slot 1 – 8): –10 dB*1, 10 kΩ, unbalanced Digital input (slot 1 – 4): 24 bit/48 kHz MIX output (slot 1 – 8): –14 dB*1, 330 Ω (CH1 prefader output), unbalanced Digital output (slot 5 – 7): 24 bit/48 kHz Power supply (slot 1 – 8): +24 V, –24 V, +6 V DC	
Digital Audio Signal Reference Level	–20 dB FS	
Power Bandwidth	[Direct] 20 – 20,000 Hz, 0.02% THD [Transformer] 50 – 20,000 Hz, 0.5% THD	
Frequency Response	Power amplifier section: 20 – 20,000 Hz, +0, –1 dB Analog input module to speaker output: 20 – 20,000 Hz, +1, –3 dB	
Total Harmonic Distortion	Power amplifier section: 0.008% (22 kHz LPF, 1 kHz, rated power) Analog input module to speaker output: 0.008% (22 kHz LPF, 1 kHz, rated power)	
S/N Ratio	At Input short, 20 – 20,000 Hz, ALL FLAT or OFF setting Output volume min.: 90 dB (preamplifier output) Output volume max.: 61 dB (preamplifier output, input 1 volume: 0 dB, other inputs: OFF) Power amplifier section: 110 dB	
Cross Talk	Over 64 dB (at 20 kHz)	
Tone Control	Bass: ±12 dB (at 100 Hz) Treble: ±12 dB (at 10 kHz)	
Parametric Equalizer	10 bands, Frequency: 20 – 20,000 Hz, 31 steps, Variable range: ±12 dB, Q: 0.3 – 5	
Speaker Equalizer	15 (compatible with TOA speakers only)	
High-pass Filter	–12 dB/oct, Variable frequency range: 20 – 400 Hz, 14 steps	
Low-pass Filter	–12 dB/oct, Variable frequency range: 4,000 – 20,000 Hz, 8 steps	
Compressor	Depth: 1 – 5	
Delay	0 – 40 ms (1 ms steps), maximum 40 ms (CH1 + CH2), mixer mode only	
Scene/Event Memory	32	
Operation Mode	Matrix mode/Mixer mode (selector switch)	
Auxiliary Function	Key lock function	
Control Input/Output	RS-232C*2, D-sub connector (9P, female) Control input: 4 inputs, no-voltage make contact input, open voltage: 3.3 V DC, short-circuit current: under 1 mA, removable terminal block (14 pins) Control output: 4 outputs, open collector output, withstand voltage: 27 V DC, control current: 50 mA, removable terminal block (14 pins) Remote volume: 2 channels, connect a 10 kΩ/linear taper variable resister or input the DC voltage of 0 to +10 V, removable terminal block (14 pins)	

Operating Temperature	–10 to +40°C	
Operating Humidity	35% to 80% RH (no condensation)	
Finish	Panel: Aluminum, hair-line, black Case: Surface-treated steel plate, black, paint	
Dimensions	420 (w) x 107.6 (h) x 355 (d) mm	
Weight	11 kg	13 kg

*1 0 dB = 1 V
*2 Allowing it to be controlled by a control system such as AMX and Crestron through RS-232C port.

Notes
- The design and specifications are subject to change without notice for improvement.
- AMX is a trademark of AMX Corporation.
- Crestron is a trademark of Crestron Electronics, Inc.

- **Accessories**

Power cord (2 m) 1
Rack mounting bracket 2
Bracket mounting screw (M4 x 16) 4
Blank panel 7
Blank panel mounting screw (M3 x 8) 14
Removable terminal plug (3 pins) 1
Removable terminal plug (7 pins) 1
Removable terminal plug (14 pins) 1
CD-ROM 1
Start guide 1

27.5. A-9240SH

Power Source	120 V AC, 60 Hz
Power Consumption	250 W
Audio Input	Max. 8 channels, modular construction (modules optional) Power amplifier input: 0 dB*1, 10 kΩ, RCA pin jack
Audio Output	Preamplifier output 1: 0 dB*1, 300 Ω, unbalanced, RCA pin jack Preamplifier output 2: 0 dB*1, 600 Ω, balanced, removable terminal block (3 pins) Speaker output: 240 W, 21 Ω, BTL output, removable terminal block (4 pins)
Module Slot	Analog input (slot 1 – 8): –10 dB*1, 10 kΩ, unbalanced Digital input (slot 1 – 4): 24 bit/48 kHz MIX output (slot 1 – 8): –14 dB*1, 330 Ω (CH1 prefader output), unbalanced Digital output (slot 5 – 7): 24 bit/48 kHz Power supply (slot 1 – 8): +24 V, –24 V, +6 V DC
Digital Audio Signal Reference Level	–20 dB FS
Power Bandwidth	20 – 20,000 Hz, 0.008% THD
Frequency Response	Power amplifier section: 20 – 20,000 Hz, +0, –1 dB Analog input module to speaker output: 20 – 20,000 Hz, +1, –3 dB
Total Harmonic Distortion	Power amplifier section: 0.0008% (22 kHz LPF, 1 kHz, rated power) Analog input module to speaker output: 0.008% (22 kHz LPF, 1 kHz, rated power)
S/N Ratio	At Input short, 20 – 20,000 Hz, ALL FLAT or OFF setting Output volume min.: 90 dB (preamplifier output) Output volume max.: 61 dB (preamplifier output, input 1 volume: 0 dB, other inputs: OFF) Power amplifier section: 110 dB
Cross Talk	Over 64 dB (at 20 kHz)
Tone Control	Bass: ±12 dB (at 100 Hz), Treble: ±12 dB (at 10 kHz)
Parametric Equalizer	10 bands, Frequency: 20 – 20,000 Hz, 31 steps, Variable range: ±12 dB, Q: 0.3 – 5
Speaker Equalizer	15 (compatible with TOA speakers only)
High-pass Filter	–12 dB/oct, Variable frequency range: 20 – 400 Hz, 14 steps
Low-pass Filter	–12 dB/oct, Variable frequency range: 4,000 – 20,000 Hz, 8 steps
Compressor	Depth: 1 – 5
Delay	0 – 40 ms (1 ms steps), maximum 40 ms (CH1 + CH2), mixer mode only
Scene/Event Memory	32
Operation Mode	Matrix mode/Mixer mode (selector switch)
Auxiliary Function	Key lock function
Control Input/Output	RS-232C*2, D-sub connector (9P, female) Control input: 4 inputs, no-voltage make contact input, open voltage: 3.3 V DC, short-circuit current: under 1 mA, removable terminal block (14 pins) Control output: 4 outputs, open collector output, withstand voltage: 27 V DC, control current: 50 mA, removable terminal block (14 pins) Remote volume: 2 channels, connect a 10 kΩ/linear taper variable resister or input the DC voltage of 0 to +10 V, removable terminal block (14 pins)
Operating Temperature	–10 to +40°C
Operating Humidity	35% to 80% RH (no condensation)
Finish	Panel: Aluminum, hair-line, black Case: Surface-treated steel plate, black, paint
Dimensions	420 (w) x 107.6 (h) x 395 (d) mm
Weight	11 kg

*1 0 dB = 1 V
*2 Allowing it to be controlled by a control system such as AMX and Crestron through RS-232C port.

Notes
- The design and specifications are subject to change without notice for improvement.
- AMX is a trademark of AMX Corporation.
- Crestron is a trademark of Crestron Electronics, Inc.

- **Accessories**

Power cord (2 m) 1
Rack mounting bracket 2
Bracket mounting screw (M4 x 16) 4
Blank panel 7
Blank panel mounting screw (M3 x 8) 14
Removable terminal plug (3 pins) 1
Removable terminal plug (4 pins) 1
Removable terminal plug (14 pins) 1
CD-ROM 1
Start guide 1

27.6. Optional Modules

27.6.1. D-001T

Power Source	+24 V DC, –24 V DC, +6 V DC
Current Consumption	20 mA (at +24 V DC), 20 mA (at –24 V DC), 60 mA (at +6 V DC)
Input	2 channels, 3 kΩ (when the phantom power is ON) / 10 kΩ (phantom power is OFF), electronically-balanced, removable terminal block (3 pins)
Input Sensitivity	–60, –54, –48, –42, –36, –30, –24, –18, –10 dB* (selectable)
Frequency Response	20 – 20,000 Hz +1, –3 dB
Total Harmonic Distortion + N	0.008% (at 1 kHz, 20 – 20,000 Hz BPF, Input sensitivity: –10 dB)
Input Equivalent Noise	Under –112 dB (at 20 – 20,000 Hz BPF, Input short, Input sensitivity: –60 dB)
S/N Ratio	Over 73 dB (at 20 – 20,000 Hz BPF, Input short, Input sensitivity: –10 dB)
Cross Talk	Over 75 dB (at 20 kHz, Input sensitivity: –10 dB)
CMRR	Over 62 dB (at 1 kHz, Input sensitivity: –60 dB)
A/D Converter	24 bit Δ∑ADC
Sampling Frequency	48 kHz
Tone Control	Bass: ±12 dB (at 100 Hz) Treble: ±12 dB (at 10 kHz)
Parametric Equalizer	10 bands, Frequency: 20 – 20,000 Hz, 31 steps, Variable range: ±12 dB, Q: 0.3 – 5
High-pass Filter	–12 dB/oct, Variable frequency range: 20 – 400 Hz, 14 steps
Low-pass Filter	–12 dB/oct, Variable frequency range: 4,000 – 20,000 Hz, 8 steps
Compressor	Depth: 1 – 5
Phantom Power	+24 V DC
Operating Temperature	–10 to +40°C
Finish	Panel: Aluminum, hair-line
Dimensions	35 (w) x 78 (h) x 91.5 (d) mm
Weight	82 g

* 0 dB = 1 V

Note: The design and specifications are subject to change without notice for improvement.

• **Accessories**

Removable terminal plug (3 pins) 2
Machine screw M3 x 8 2

27.6.2. D-001R

Power Source	+24 V DC, –24 V DC, +6 V DC
Current Consumption	20 mA (at +24 V DC), 20 mA (at –24 V DC), 60 mA (at +6 V DC)
Input	2 channels, 2 RCA jacks/ch mixed, 10 kΩ, unbalanced, RCA jack
Input Sensitivity	–60, –54, –48, –42, –36, –30, –24, –18, –10 dB* (selectable)
Frequency Response	20 – 20,000 Hz +1, –3 dB
Total Harmonic Distortion + N	0.008% (at 1 kHz, 20 – 20,000 Hz BPF, Input sensitivity: –10 dB)
S/N Ratio	Over 70 dB (at 20 – 20,000 Hz BPF, Input short, Input sensitivity: –10 dB)
Cross Talk	Over 75 dB (at 20 kHz, Input sensitivity: –10 dB)
A/D Converter	24 bit ΔΣADC
Sampling Frequency	48 kHz
Tone Control	Bass: ±12 dB (at 100 Hz) Treble: ±12 dB (at 10 kHz)
Parametric Equalizer	10 bands, Frequency: 20 – 20,000 Hz, 31 steps, Variable range: ±12 dB, Q: 0.3 – 5
High-pass Filter	–12 dB/oct, Variable frequency range: 20 – 400 Hz, 14 steps
Low-pass Filter	–12 dB/oct, Variable frequency range: 4,000 – 20,000 Hz, 8 steps
Compressor	Depth: 1 – 5
Operating Temperature	–10 to +40°C
Finish	Panel: Aluminum, hair-line
Dimensions	35 (w) x 78 (h) x 91.5 (d) mm
Weight	82 g

* 0 dB = 1 V

Note: The design and specifications are subject to change without notice for improvement.

• **Accessories**

Machine screw M3 x 8 2

27.6.3. T-001T

Power Source	+24 V DC, –24 V DC, +6 V DC
Current Consumption	35 mA (at +24 V DC), 35 mA (at –24 V DC), 60 mA (at +6 V DC)
Output	2 channels, max. +20 dB* (at 10 kΩ load), 600 Ω, electronically-balanced, removable terminal block (3 pins)
Frequency Response	20 – 20,000 Hz +1, –3 dB
Total Harmonic Distortion + N	0.005% (at 1 kHz, 20 – 20,000 Hz BPF, 5 V output, 10 kΩ load)
S/N Ratio	Over 73 dB (at 20 – 20,000 Hz BPF)
Residual Noise	Under –91 dB (at 20 – 20,000 Hz BPF, VOL: –70 dB)
Cross Talk	Over 87 dB (at 20 kHz)
D/A Converter	24 bit ΔΣDAC
Sampling Frequency	48 kHz
Tone Control	Bass: ±12 dB (at 100 Hz) Treble: ±12 dB (at 10 kHz)
Parametric Equalizer	10 bands, Frequency: 20 – 20,000 Hz, 31 steps, Variable range: ±12 dB, Q: 0.3 – 5
Speaker Equalizer	15 (compatible with TOA speakers only)
High-pass Filter	–12 dB/oct, Variable frequency range: 20 – 400 Hz, 14 steps
Low-pass Filter	–12 dB/oct, Variable frequency range: 4,000 – 20,000 Hz, 8 steps
Compressor	Depth: 1 – 5
Delay	0 – 40 ms (1 ms step), maximum 40 ms (CH1 + CH2), mixer mode only
Operating Temperature	–10 to +40°C
Finish	Panel: Aluminum, hair-line
Dimensions	35 (w) x 78 (h) x 91.5 (d) mm
Weight	82 g

* 0 dB = 1 V

Note: The design and specifications are subject to change without notice for improvement.

• **Accessories**

Removable terminal plug (3 pins) 2
Machine screw M3 x 8 2

27.6.4. C-001T

Power Source	6 V DC
Current Consumption	15 mA
Control Input	8 channels, open voltage: 3.3 V DC, short-circuit: under 1 mA, removable terminal block (9 pins)
Control Output	8 channels, open collector output, withstand voltage: 27 V DC, control current: max. 50 mA, removable terminal block (9 pins)
Operating Temperature	–10 to +40°C
Finish	Panel: Aluminum, hair-line
Dimensions	35 (w) x 78 (h) x 91.5 (d) mm
Weight	62 g

Note: The design and specifications are subject to change without notice for improvement.

• **Accessories**

Removable terminal plug (9 pins) 2
Machine screw M3 x 8 2

27.6.5. ZP-001T

Power Source	+24 V DC, +6 V DC
Current Consumption	38 mA (at +24 V DC), 18 mA (at +6 V DC)
Number of Lines	1 line
Type of Selectable Signal	DTMF signal
Signaling System	Loop-Start (or Ground-Start, selectable)
TEL Line	0 dB, 600 Ω, balanced, transformer-isolated, RJ-11 connector, loop voltage: 24 V DC or more, which should be supplied from the PABX.
Paging Input	0 dB, 600 Ω, balanced, transformer-isolated audio input, removable terminal block (4 pins)
Control Input	1 channel, no-voltage make contact, open voltage: 5 V DC, short-circuit: 0.5 mA, removable terminal block (4 pins)
Control Output	4 channels, open collector output (isolated), withstand voltage: 35 V DC, control current: max. 50 mA, removable terminal block (4 pins)
Operating Temperature	–10 to +40°C
Finish	Panel: Aluminum, hair-line
Dimensions	35 (w) x 78 (h) x 91.5 (d) mm
Weight	153 g

Note: The design and specifications are subject to change without notice for improvement.

• **Accessories**

Removable terminal plug (4 pins) 3
Machine screw M3 x 8 2

27.6.6. AN-001T

Power Source	+24 V DC, –24 V DC, +6 V DC
Current Consumption	20 mA (at +24 V DC), 20 mA (at –24 V DC), 60 mA (at +6 V DC)
Input	Sensor input (Ambient noise sensor microphone input): 2 channels, 3 kΩ (when the phantom power is ON)/10 kΩ (when the phantom power is OFF), electronically-balanced, removable terminal block (3 pins)
Input Sensitivity	–60, –54, –48, –42, –36, –30, –24, –18, –10 dB* (selectable)
Phantom Power	+24 V DC
A/D Converter	24 bit ΔΣADC
Sampling Frequency	48 kHz
Ambient Noise Control Function	Sensor input reference level adjustment function Maximum output signal level control: –15 to 0 dB Minimum output signal level control: –18 to – 3 dB Sample time setting: 10 s, 15 s, 20 s, 30 s, 1 min, 2 min, 3 min, 5 min Gain ratio setting (Ambient noise to Output signal level): 6:3, 5:3, 4:3, 3:3, 3:4, 3:5, 3:6, 6:–3, 5:–3, 4:–3, 3:–3, 3:–4, 3:–5, 3:–6
Operating Temperature	–10 to +40°C
Finish	Panel: Aluminum, hair-line
Dimensions	35 (w) x 78 (h) x 91.5 (d) mm
Weight	82 g

* 0 dB = 1 V

Note: The design and specifications are subject to change without notice for improvement.

• **Accessories**

Removable terminal plug (3 pins) 2
Machine screw M3 x 8 2

27.7. Optional Accessories

27.7.1. AN-9001

Type	Electret condenser microphone
Phantom Power	14 – 26 V DC
Current Consumption	7 mA (at 24 V DC)
Directivity	Omnidirectional (hemispherical)
Impedance	200 Ω
Rated Sensitivity	–5 dB (1 kHz, 0 dB = 1 V/Pa)
Frequency Response	100 – 10,000 Hz
Output Terminal	Removable terminal block (3 pins)
Operating Temperature	–10 to +40°C
Finish	Panel: ABS resin, white Frame, Case: Surface-treated steel plate
Dimensions	ø130 x 37 (d) mm
Weight	170 g

Note: The design and specifications are subject to change without notice for improvement.

• **Accessories**

Removable terminal plug (3 pins) 1
Machine screw No. 6-32 UNC x 30 2
Machine screw M4 x 30 2

27.7.2. ZM-9001

Applicable Cable	Single conductor shielded cable
Line Resistance	50 Ω or less (per line)
Terminal	M3 screw terminal, distance between barriers: 7.62 mm
Operating Temperature	–10 to +40°C
Finish	Surface-treated steel plate, white, paint
Dimensions	72 (w) x 127 (h) x 45 (d) mm
Weight	170 g

Note: The design and specifications are subject to change without notice for improvement.

• **Accessories**

Machine screw (for box mounting) No.6-32UNC x 30 2
Machine screw (for box mounting) M4 x 30 2
Machine screw (for panel mounting) No.6-32UNC x 6 2

27.7.3. ZM-9002

Applicable Cable	Single conductor shielded cable
Line Resistance	50 Ω or less (per line)
Terminal	M3 screw terminal, distance between barriers: 7.62 mm
Operating Temperature	–10 to +40°C
Finish	Surface-treated steel plate, white, paint
Dimensions	72 (w) x 127 (h) x 56 (d) mm
Weight	170 g

Note: The design and specifications are subject to change without notice for improvement.

• **Accessories**

Machine screw (for box mounting) No.6-32UNC x 30 2
Machine screw (for box mounting) M4 x 30 2
Machine screw (for panel mounting) No.6-32UNC x 6 2

27.7.4. ZM-9003

Line Resistance	250 Ω or less (per line)
Terminal	Removable terminal block (7 pins)
Operating Temperature	–10 to +40°C
Finish	Surface-treated steel plate, white, paint
Dimensions	120 (w) x 127 (h) x 53.3 (d) mm
Weight	375 g

Note: The design and specifications are subject to change without notice for improvement.

• **Accessories**

Machine screw (for box mounting) No.6-32UNC x 30 4
Machine screw (for box mounting) M4 x 30 4
Machine screw (for panel mounting) No.6-32UNC x 6 4
Removable terminal plug (7 pins) 1

27.7.5. SS-9001

Power Source	Supplied from the optional AD-246 AC adapter or an external 24 V DC/200 mA power supply.
Current Consumption	120 mA
Control Signal	No-voltage make contact input (polarized), open voltage: 24 V DC, short-circuit current: 3 mA
Control Power	Under 240 W (70 V/100 V line)
Speaker Terminal	Removable terminal block (2 pins)
Control Terminal	Removable terminal block (10 pins)
Operating Temperature	–10 to +40°C
Finish	Case: Surface-treated steel plate
Dimensions	112 (w) x 197 (h) x 30 (d) mm
Weight	530 g

Note: The design and specifications are subject to change without notice for improvement.

• **Accessories**

Removable terminal plug (2 pins) 6
Removable terminal plug (10 pins) 1
Cord clamp 1
Tapping screw 4 x 20 4

TOA Corporation

200711 CU